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THE
SCOTTISH GARDENER,
A
MAGAZINE OF HORTICULTURE
AND FLORICULTURE.

VOL. VI.

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THE SCOTTISH GARDENER.

THE ROSE CATALOGUES OF 1856—1857.

A Descriptive Catalogue of Roses, by William Wood & Son, Woodlands, Maresfield, Sussex.

A Descriptive Catalogue of Roses, by Thomas Rivers, Sawbridgeworth, Herts.

Catalogue of Roses, by Henry Lane & Son, Great Berkhamsted, Herts.

A. Paul & Sons' Rose Catalogue for 1856—1857, Cheshunt, Herts.*

To the lover of Roses, the arrival of the annual Rose Catalogues affords occasions of pleasurable excitement. As they successively drop in, the old Athenian enquiry is suggested, "What new thing?" and when the new or unknown varieties have been marked, their descriptions conned, and their beauties dwelt on by help of the imagination, then come the questions, Shall we buy? And how many? Or wait for another year? Or rely on some liberal neighbour for buds? Truly it is not easy to resist temptation. They are knowing folks, these compilers of Rose catalogues! How neat and characteristic their descriptions! how complete and satisfying their information, and how very reasonable, upon the whole, their prices! By the help of steam, and the penny postage, they have established a nearly uniform tariff of charges throughout the kingdom. They winnow the importations from France, from most of the

* We copy the above titles in the order in which the catalogues reached us, and we make them the ground of our remarks, not as sending our Scottish readers to English nurserymen, but as affording the earliest information on the subject.

chaff of which, at one time, they were nearly wholly composed. Their catalogues have tended to give an almost universal diffusion to the taste for Roses; in which, indeed, they have been aided or preceded by such works as "Rivers' Rose Amateur's Guide," "Paul's Rose Garden," and the magnificent coloured plates of Roses, published by Curtis of Bristol.

A prodigious improvement on the Queen of Flowers has taken place during the last forty years. Our first acquaintance with Roses was made in a Rosarium, formed about the commencement of that period, and we believe, that out of 200 varieties, the best that could then be procured, there were hardly a dozen that would be considered more than third-rate sorts now. Previous to 1830, the Rose du Roi, or Lee's Perpetual, and some other first-class sorts began to appear in France. The "Rose Fancier's Manual," a work of large promise, but small performance, edited by Mrs Gore, contains notices of the origination of some of these—the only reason that makes the book worth preserving. Mr Rivers' catalogue for 1839-40, which is otherwise valuable for its numerous synonyms, exhibits a great advance. The varieties are arranged nearly in the same families as they are now; many Summer Roses are enumerated, which still hold a first place in every collection; but the Hybrid Perpetuals, now the glory of the Rose garden, are not yet separated from the Damask Perpetuals, and indeed the well known Madame Laffay, and two or three others now forgotten, are the only specimens of that section which had then appeared. Since that period the race of improvement has been singularly rapid. Paris, Angers, and Lyons have vied with each other in pouring into the market Roses of the most beautiful colour, and of the most exquisite form. And if the Rose nurseries in Britain have not originated many new varieties, they have multiplied with wonderful speed, and to immense extent the existing kinds. The taste for Roses, first diffused among the middle classes of society, has descended to the well-doing cottagers. Even in obscure villages in Scotland, it is interesting and gratifying to observe the walls of the houses covered with Coupe d'Hebe, Charles Duval, and Boula de Nanteuil, and their gardens graced with Beauty of Billiard, and Lanei Moss.

In the career of improvement the Rose has run against the Dahlia, and perhaps in the estimation of some, has not kept pace with it, in perfection of form and delicacy of tint. It must be admitted that the form of some Dahlias has not been at all approached by the Rose, and probably never will. Many of the quilled Dahlias resemble more the engine-turning on the case of a watch than aught else: and this property they owe to the intimately circular structure of the flower in its natural state. Belonging to the order of Compositæ, the flower is composed of a disk and a circle of rays, and the florets in the disk are all arranged in numerous concentric circles. In the single Rose there are only three well-marked circles, viz., the sepals, petals, and stamens, with a bundle of styles in the centre;

and only the stamens and styles can pass into petals; hence, the Rose in becoming double, has a tendency to assume the plaited or compact form. It is somewhat wonderful that the forms of many Roses are so near perfection as they are. In diversity and gracefulness of inflorescence, and more particularly in sweetness and richness of fragrance, the Dahlia can sustain no comparison with the Rose.

For a time Rose growers were much given to accumulate a multitude of sorts, but the great and continual increase of varieties has forced on them the work of selection. Some nurserymen cultivate only the Roses which have a secondary period of flowering in autumn; and even Mr Rivers is swaying towards that result. Prefixed to his catalogue of summer Roses, he has the following paragraph:—"The numerous varieties of this class, once nominally more than 2000, have now become of secondary interest, except for showing as single blooms for prizes, owing to the introduction of so many beautiful autumnal Roses, more particularly the varieties of Hybrid Perpetuals, which now comprise all that is most perfect and beautiful in form and colour. A summer Rose-tree, whether bush or standard, when its flowers have passed away, is a most uninteresting object; in a few years, it is most probable that, with the exception of Moss Roses, summer Roses will be spoken of as things that were." Rose Cat. p. 2. With all deference to Mr Rivers' acknowledged authority and taste, we must protest against this doctrine, in behalf of Scotland at least. We will not give up our summer Roses. They are on the whole hardier and better adapted for our climate than the Hybrid Perpetuals, many of them raised at Lyons, or in some of the warmer districts of France, and with a large infusion of China blood in them. Many of the former, such as the Coupe d'Hebe, Chenedolé, Kean, Madame Zoutman, and some hundred others in the same families, "make glorious summer" in July, when our weather is at the finest; and at that season, so far as we have seen, they are as yet not quite equalled by the Hybrid Perpetuals. In Scotland, at least, the flowering of the latter in September and October—greatly to be prized in itself—is only a faint Indian summer compared with the full-orbed glory of the former season. We have seen, at a flower show in Edinburgh, a large collection of blooms of autumnal Roses from a leading nursery; we could recognise the varieties, but when we considered the diminution in the size, the looseness of the petals, and the paleness of the colours, we could only say, alas, how changed! Probably this undeniable falling off in autumn is partly owing to want of high culture, and partly to the coldness of the position occupied by the plants. It is folly to put half-tender sorts, such as Paul Dupay, La Reine, or Auguste Mie on exposed lawns, and to expect that they will grow well, not to say bloom well, when the warmth of summer has departed.

But while we protest against that exclusiveness of taste which would banish summer Roses from our gardens, we readily admit the excellence and beauty of the Hybrid Perpetuals as a class. We copy the following eloquent description of them from the Catalogue of Messrs Wood :—"This invaluable and justly popular class has, in a comparatively short time, appeared and surprised us with the almost innumerable and very splendid varieties which it contains; indeed, it is difficult to imagine anything more gorgeous than groups of these splendid Roses enlivening the garden with a succession of their elegantly formed, and deliciously fragrant flowers, from early summer until hoary winter. Nearly all the varieties form fine standards, and as dwarfs for pot-culture they are quite unequalled, flowering with certainty when forced; and being easily excited, they may be made to bloom much earlier than the Moss or other Roses. To the cultivator for exhibition, they are of the greatest importance; several of the sorts are suitable to plant against pillars and walls; and nearly all grow and flower more freely budded on the Dog-Rose, than on their own roots."—Rose Cat., p. 13. Mr Rivers is equally emphatic in his approbation of them; and in relation to their old rivals the Bourbons, he remarks: "They are not now esteemed as formerly, owing to their want of fragrance; in this respect the Hybrid Perpetuals are beyond measure superior to them."

We give the following notes from Rivers in regard to some recently approved varieties. General Jacqueminot :—"This magnificent Rose is admirably calculated for a group, if a perfect blaze of beauty is wished for." Jules Margottin :—"This season (1856) has proved highly favourable to this fine Rose; in size and perfection of shape, it has been most beautiful." Lord Raglan :—"In the hot scorching weather of the past summer this brilliant Rose was quite dazzling in its vivid scarlet, thus proving more valuable than the Geant, which generally changes into a dingy purple in bright sunshine." Prince Leon :—"This most beautiful Rose is still unrivalled in summer or in autumn, in the forcing house or greenhouse; it is always perfect in shape and brilliant in colour."—Rose Cat., pp. 8, 9.

For many years the Rose nurserymen were, not unlike the music-sellers, too much taken up with the novel and the fashionable; and with much just appreciation of what was old, were rather prone to laud excessively what was new. Perhaps some of them are not altogether free from this failing still. Against this Mr Rivers has set his face. He keeps a sort of awkward squad in which he stations all new comers till they have proved themselves worthy of promotion. And when he grants them brevet he sometimes reduces popular favourites into the said awkward squad. For this integrity and severity of taste, the public ought to feel obliged to him. A profound judge of human nature, however, has remarked that we would rather have our opinions than our tastes questioned. Mr Rivers'

judgments have called forth a lively squib in the "Midland Florist," called "The War of the Roses." Another writer in a more serious style, in the "Gardeners' Chronicle," almost loses his temper, and says—"The old Roses are the best yet. I do not believe that there are six better than Coupe d'Hebe, Baronne Prevost, Geant des Batailles, La Reine, Madame Laffay, Prince Leon. This last is a prince indeed, but La Reine beats all when it opens properly; it is uncertain, that is its fault. If you want six more, the following are first-rate:—General Jacqueminot (hyb. ch.), Louis Bonaparte (hyb. perp.), Triomphe de Paris (hyb. perp.), William Griffiths (hyb. perp.), William Jesse (hyb. perp.), Souvenir de la Malmaison. These are twelve old Roses not beaten yet in my opinion."—"Gardeners' Chronicle," 1856, p. 773. This somewhat querulous letter has called forth a clever reply from Mr William Paul, of Cheshunt, in which, we are sorry to say, he pulls to pieces some of our old favourites. Very justly, however, he remarks, that in order to guard against worthless novelties, we should "keep a watchful eye on the sources whence real acquisitions proceed, and whether a dealer errs from ignorance, carelessness, or selfishness. All will err occasionally, but there are those who err continuously, and they should be ignored in future dealings." "For twelve proved new Roses," he continues, "I would invite attention to the following:—Hybrid Perpetuals—General Castellane (rich crimson), General Jacqueminot (brilliant purplish red), Gloire de Vitry (bright rose), Lord Raglan (scarlet crimson), Madame Desirée Giraud (white, striped with carmine), Madame Cambaceres (rich rosy carmine), Madame Masson (reddish crimson changing to violet), Madame Martel (white suffused with rose), Madame Vidot (transparent flesh colour), Souvenir de Leveson Gower (dark red, changing to ruby). Bourbon—Prince Albert (the best Bourbon Rose). Tea-scented—Gloire de Dijon (yellow, shaded with salmon). He adds that the difficulty of judging newly imported Roses the first season arises from their growing feebly in consequence of their roots being dried in the transmission. Out of 70 or 80 newly imported Roses, he gives the following list as having bloomed to his satisfaction:—Hybrid Perpetual—Arthur de Sansal, Bacchus (crimson scarlet, brighter than the Geant des Batailles), Dr Henon, Genera, Simpson, Imperatrice des Français, Mathurin Regnier, Madame Knorr, Ornament des Jardins, Paeonia, Prince Noir, Souvenir de la Reine d'Angleterre, Triomphe de l'Exposition, Triomphe d'Avranches."—"Gardeners' Chronicle," 1856, p. 788. In the next Number of the "Chronicle" Mr Charles Wood, of Maresfield, writes, approving generally of the opinions of Mr Paul, and gives a shorter list of new Roses, as having succeeded at Maresfield, consisting of some of the above; and in addition to them:—General Pelissier, Pauline Lansezeur, Toujours Fleuri, and Imperatrice Eugenie."—"Gardeners' Chronicle," p. 805.

If we may venture to express our opinions in company with such

experienced cultivators, we would advise our readers to study well the adaptation of particular Roses to the climate and elevation of their gardens. It is remarkable how much the colour and whole appearance of Roses vary in different localities. In our own little garden, which is about 400 feet above the level of the sea, and with a damp soil, we have been perfectly successful with pure and simple colours. Our bushes have been as large and our flowers as perfectly formed, we will venture to say, as any in Scotland; but the shaded varieties, particularly those shaded with purple and violet, have always turned out inferior. For example, at a lower elevation in the same county, we have seen Hyb. Bourb. Legouv  glowing like a burning coal, while with us it is almost always of a dull livid purple. For this reason, we have dropped from our collection Comte de Rambateau, Duc de Trevis , Brown's Superb, and some others; and we fear that Ohl must be abandoned too. This may be partly owing to a tenderness in the petals; as we find Comte Platter and Charles Souchet thoroughly spoiled by a moderate shower of rain.

S.

SIKKIM AND BOOTAN RHODODENDRONS AT BIDDULPH GRANGE.

MR BATEMAN (the proprietor) has been so singularly successful in providing place for this uncommon group of plants, and has so many of the species under cultivation, that it will no doubt be acceptable to other growers to receive the list of his plants and his statement respecting them, as it has been kindly communicated. He says: "The following Sikkim and Bootan Rhododendrons have stood without protection during last winter, and most of them for two seasons:—

<i>From Sikkim.</i>	<i>From Bootan.</i>
Rhododendron Falconeri.	Rhododendron eximium.
... Hodgsoni.	... Hookeri.
... ciliatum.	... Windsori.
... Thomsoni.	... leucanthum.
... fulgens.	... Kendricki.
... lanatum.	... Shepherdii.
... niveum.	... Jenkinsi.
... seruginosum.	... Keysi, (this literally
... Wallichii.	growing like a Willow, making shoots
... Wightii.	two feet long, but not yet attempting to
... campanulatum.	flower.)
... robustum.	
and several common species.	

"The above are all planted against perpendicular masses of rock facing the north, and most of them in damp and dark situations, screened from every wind; such being the conditions in which Dr Hooker (in his Himalayan journals,) describes these plants as most luxuriant in their native habitats. Such an arrangement has the further advantage in this climate, of retarding their growth in the spring, for all are of an excitable nature, and therefore, liable to be injured by late frosts. A marked improvement has, however, been noticed in those species that have stood out during two winters; these

ing, to a considerable extent, accommodated themselves to circumstances, and exhibited less disposition to make an early growth than was the case after their first winter. *R. eximium* may be taken as a case in point. Of two specimens of the same size, one was turned out in the summer of 1854, the other in 1855. The former was seriously injured by a late frost last year; but this season did not commence its growth until after the occurrence of a severe frost which damaged the one that had been planted last. The plant turned out in 1854, has made magnificent leaves this season.

"Besides the species already enumerated, all of which occupy sheltered situations, there are other Sikkim Rhododendrons, such as *R. glaucum*, *R. setosum*, *R. lepidotum*, *R. anthopogon*, &c., which being naturally found at a much greater elevation, are planted here on higher and more exposed ledges of rock, where they seem to thrive in company with *R. hirsutum*, *R. ferrugineum*, &c. *R. lepidotum*, *R. setosum*, and *R. glaucum*, have already flowered."—*Gardener's Chronicle* 1856, p. 775.

The above extract, from an account of Biddulph Grange, by Mr E. Kemp, of Birkenhead, must be extremely interesting to those who hope to see the Sikkim Rhododendrons grown out of doors in this country. We have some misgivings, however, as to any of the more tender sorts being planted against rocks facing to the north. Unquestionably that is the safest position for them in spring; but we fear that, unless the summers are extremely warm at Biddulph Grange, the plants so placed will be more productive of leaves than of flower buds, and that like *R. Keysi*, they will be readier to grow like willows than to blossom. It is known that in cool climates and in elevated situations in Scotland, the hybrids of *R. arboreum*, many of the Azaleas, and even *Kalmia latifolia* are very chary in giving flowers. In our end of the island, Rhododendrons, Azaleas, &c., should not, as a general rule, be planted in the shade, but rather in the full blaze of the sun on the open ground, with soft peaty or vegetable soil, and should have abundance of water given them in the dry periods of the year. On the other hand, it is also known that tender and half-hardy Rhododendrons flowered beautifully on a walk with a north aspect in the Royal Botanic Gardens, Edinburgh. We are not aware that the excellent Curator has given an account of his experience in this matter to the horticultural world. In the meantime, we would rather plant the Sikkim Rhododendrons in positions open to the south, and provide them with horizontal hoods of spruce fir branches, or of furze in winter, and interpose perpendicular screens of similar materials between them and the sun's rays in spring. Possibly Mr Bateman has made the best choice he could on the balance of advantages in his own case; and we shall be glad to hear of his subsequent experience. Whatever is to be the fate of the hardier Sikkim Rhododendrons, we suppose the home of the large leaved species will be in the large glazed house with span roof, commonly called the winter garden, or in the Rhododendron house, which we hope to see erected in many places. We shall not soon forget the delight with which we gazed on the blossoms of *R. Dalhousiæ* in the garden of

the Caledonian Horticultural Society. It was of a dreamy sort of beauty—something like a Lily on an evergreen tree. We believe that *R. Edgeworthi* also flowered in the same establishment, as elsewhere in Scotland. The following notes of the elevations at which the species grow in their native habitats, may interest some who have not access to the *Himalayan Journals*:—Ascending from 6000 feet above the level of the sea, occur *R. Dalhousiæ*, *R. vaccinioides*, *R. camelliæflorum*, *R. arboreum*; above 8000 feet, *R. argenteum*, *R. Falconeri*, *R. barbatum*, *R. Campbelliæ*, *R. Edgeworthi*, *R. niveum*, *R. Thomsoni*, *R. cinnabarinum*, *R. glaucum*; above 10,500 feet, *R. lanatum*, *R. virgatum*, *R. campylocarpum*, *R. ciliatum*, *R. Hodgsoni*, *R. campanulatum*; above 12,000 feet, *R. lepidodum*, *R. fulgens*, *R. Wighti*, *R. anthopogon*, *R. setosum*. A fuller list and farther particulars may be found in the letterpress accompanying the beautiful coloured engravings of East India *Rhododendrons* published by Dr Hooker.

S.

BARBAROSSA GRAPE.—This Grape, like the Stanwick Nectarine, although brought into public notice under a high-sounding character, will, I believe, be ultimately discarded from private collections, unless to be used as a stock, upon which to graft the weak growing kinds, and for such a purpose, it is very appropriate, owing to its vigorous habit. True to its recommendation, it neither shanks nor decays so readily as some of the other varieties, but the truth was not all told, it is what in gardening phraseology is called a “shy fruiter.” In a letter from Ireland this morning, I am told that age will remedy this defect, which I very much doubt; at least my experience leads to no such conclusion, which is also the opinion of the person that supplied me with the plants, although unknown to him at the time. I have no evidence to lead me to suppose that the case will be otherwise, having tried it upon the spur and long rod system of pruning. Had my Vines been imperfectly ripened, there would have existed just suspicion of the cause; but no, there was nothing of the kind, the wood was so hard in some cases as to turn the edge of the knife. There is also another unpleasant peculiarity attending the *Barbarossa*, namely, that sunshine abstracts the colouring matter from the foliage, which gives it a russet, or reddish brown appearance—quite distinct from scorching, as the leaves carry on their functional activity without any apparent interruption, nevertheless the Vines possess a neglected appearance. I have reason to believe that the loss of colour is not peculiar to my Vines, being informed by a gentleman from Derbyshire last summer, that the same occurrence takes place with his *Barbarossas*. This Grape in point of flavour is a third-rate variety—distinct from any Grape with which I am acquainted, and has a disagreeable relish, decidedly inferior to the old Syrian, and it is questionable if it can be preserved longer on the Vine. The *Barbarossa* is described in some catalogues as a purple Grape, which is hardly correct—when well coloured, it is as dark as a Black Hamburg. It is to be hoped that the Golden Hamburg, to be sent out next June will not disappoint the public, nor do I think there need be any misgivings in the matter, owing to the respectability of the person who has the management of it. But my faith at one period was just as strong in the *Barbarossa*, so much so that I planted eight Vines in a late house in connection with Oldake's St Peter's, and proposed to do wonderful things with late Grapes. My expectations have been pulverised; the *Barbarossa* has been cut down and grafted with more deserving varieties.—A. CRAMB, The Gardens, Tortworth Court, Gloucestershire.

THE PRESENT ANOMALOUS POSITION OF FRUIT CULTURE IN BRITAIN.

It is almost needless here to point to the numerous complaints of hardy fruit failure, in the widest sense of that word; indeed, the market prices attest it,—albeit not infallible evidence. It may however prove of service, to raise an inquiry as to the causes of so much disappointment. The matter becomes more astounding when we take into consideration the vaunted superiority of some kinds, places of culture, &c. We may naturally begin to ask what science has done for us; seeing that almost every other affair we can look into bears ample witness to progress. Now this is all disheartening enough I confess, and deserves a very close consideration by all fruitists. Of one thing I am assured, it is not owing to any peculiar blight or visitation such as the Potato or Vine disease; neither can we say that fruit trees in general are not so healthy as in former days; they are, in my opinion, more so; for I do not consider that the blemishes which so frequently occur in some quarters spring from degenerated constitutions. Trees may be found in abundance in many parts as healthy and prolific, and producing as fine fruit on the average as formerly.

As to temperatures, we have certainly had more severe springs than that of 1856, so that we cannot charge the failure here. Indeed, it is a difficult question to grapple with, such a mixture of causes may have combined to produce such disasters. We must, however, remember one fact connected with fructification matters: our hardy fruit trees in general had undergone two or three years of tolerably hard work previous; and whatever some persons may say, of a few kinds of Apples only being affected, by a heavy crop and resting a season in consequence, I am persuaded that all kinds of fruits are thus affected in degree. But, even admitting this, we do not find it sufficient to account for the almost universal character of the failure. There are those who insist the climate has undergone material alteration within a century or two; but I believe, on a proper investigation of the matter, the data on which they found this opinion will be found insufficient. In all these circumstances, we may very properly turn to the hygrometric character of the atmosphere; there is every reason to suppose that this has much to do in the setting of the blossoms. Whether this was in excess or the contrary, our meteorologists, who keep regular tables, are the likeliest persons to consult; and it would be well if the notes of such could be produced in the form of a comparative table. We, however, need them, not only from the four cardinal points in the kingdom, but England, Scotland, and Ireland, should stand in juxtaposition.

We have all heard of the singular failure of the great cider orchards south of the Tweed, also of the general failure that has

occurred in the gardens of the gentry in England: can Scotland offer a much better report? Indeed, had there been a surplus in either Scotland or Ireland, it would, under the market prices of the last month, have speedily found its way to the great metropolis of the South; but it is pretty well known that no such surplus exists. Of one thing we may be assured, that in these stirring times, when in the midst of much poverty many find themselves rich of a sudden, such things as choice Pears, Apples, and indeed any of what is termed "keeping fruit," will be in high request—"up higher and higher still," and that according to the spirit which pervades our market in everything else; where there is a real demand, there will soon be a supply. If it can be proved that our seasons on the average are not a match for the demands of the time we live in, art will, doubtless, supply that which nature grudges for the mere luxuries of man. This kind of conclusion very naturally leads us to think of Orchard Houses,—the leading gardening idea of the age; but they must be something more than mere horticultural toys. We now want the same amount of mind thrown into the subject, as that which first conceived the idea of a Crystal Palace. I have no doubt whatever, that I am not the only person who has thus fancied: I am assured that scores must have ruminated in the same way; and that, like a gunpowder train, it only waits the application of some fusee.

However, 'tis of no use talking of fruit trees in pots; that must be left to small amateurs, and a most interesting study they will furnish. We must have real blossoming trees, which take a deal of gathering and fill many baskets; to stop short of this, whilst chalking out any plan, will but be "the mountain in labour."

I have no doubt the day is at hand, when, like everything else, companies will be formed; and I can only hope that their course will not be a *Red-path*, or *Rob-son*. Why should not somebody set to work, and induce the leaders in our head cities, who sigh for breathing places, to make what we will call for the present a winter garden; an acre or more of ground, all glass covered—ridge and furrow if you will—and to plant all the main lines with valuable fruits, finishing off the margins with flowering shrubs; the very edges decorated with early spring bulbs, &c. The rest, of course, carried out in such a spirit. What between the sale of choice fruits and the other proceeds, I am assured that some such scheme might be made more than self-paying.

EXTEMPORE.

A FEW WORDS ABOUT POT VINES.

WHEN Grapes are required on the table every day in the year there is not a more powerful auxiliary to this end than the "Pot Vine" system. On permanent Vines in "late vineries" Grapes

will hang till March, by which time they can easily be supplied from Vines in pots. While to force permanent Vines thus early would be a precarious task, and one which, if persisted in for many seasons in succession, would soon prove ruinous to the Vines.

The pot system is gaining ground fast among extensive Grape growers, and most deservedly so; and not only is it worthy of the patronage of the large growers, but most especially so, I conceive, of the man with the one, two, or three vineries. Mr Niven, of Ireland, I believe was the first to grow pot Vines, extensively at least. Mr Brown, of Tottenham Park, England, has been long celebrated for his success in this branch of gardening, and an account of his method of so doing is to be found from his own pen in the first volume, in fact the first number, of the "Gardeners' and Land-Stewards' Journal," which periodical, to the shame of the gardeners of this kingdom, is now no more. Many others have done much to forward and recommend this mode of growing early Grapes, and none more than the author of "Fruit Culture," who is too well known to need being named, and whose first number of the above named work has had a sale unprecedented in the history of gardening literature. He has cut Grapes from pots in February. It may be said these are all great growers, and have no doubt had ample means to do such work. I am not going to forget that I have said that this system of Grape growing is especially deserving the patronage of the smaller grower. By adopting it, two crops a-year can be had from the same vinery. A correspondent informs me that he is forcing a quantity of pot Vines in a vinery, the Vines of which were planted about eighteen months ago, and which of course he does not want to start very early next spring. These permanent Vines have been turned outside, and by the time this is passing through the printer's fingers, his pot Vines will be set, and ripe in time enough for the introduction of the permanent Vines. If pot Vines are started in the end of October they will ripen in March—a good time to bring in permanent Vines for ripe Grapes in July. Thus with the aid of a second house of permanent Vines to start in January, for an intermediate crop, the season of Grapes, by the aid of the pot system, is extended over eight months in the year, with only two vineries.

It can be urged, of course, that the annual preparation of so many Vines, say 50, entails a deal of labour, and requires a good bit of room in heat to grow them properly. Almost everything that is worth having must be laboured for, and I can speak from experience, that where there is a couple of vineries and a forcing pit, 50 pots of Vines in 13-inch pots is within reach. Any odd corner where there is a fair share of light will accommodate a Vine or two, and then for a good while in early spring they do not take up much space, and as the season advances, we all know more space can be afforded.

With these few words as a plea for the growth of Vines in pots,

I will conclude by saying that those who contemplate a start should now commence by putting in a quantity of eyes immediately. They will "callous" in pure sand in an intermediate house by the beginning of February, when I may perhaps give a few hints on the practical part of the matter. In the meantime, I would recommend as best for pots the Black Hambro', White Frontignac, and Sweet Water. I have tried the Muscat of Alexandria with tolerable success. But for early work it is fickle, and requires much more heat than the others. As a standard variety, the Black Hambro' is the best. It is to be hoped now, that, as a contemporary has it, we are to have a shower of new Grapes, there will be something valuable for growing in pots. By the way, what has become of the Golden Hambro'? It has not been seen nor heard of since 1855. I suppose Mr Bushby is damming it back for a regular flood in 1857.

LISIANTHUS RUSSELLIANUS.

BY MR D. THOMSON, DYRHAM, HERTS.

STRANGE to say, this beautiful plant is rarely to be seen in private collections of plants, and few nurserymen can supply it. The gardening mind seems to have laid hold of the idea, that it is so very difficult to cultivate well—nay, even to keep it alive through the winter months, that they have given it up in despair. Considering that this non-cultivation of the Lisianthus is a loss to our late summer and autumn show of flowers, which can scarcely be made up, and thinking that the idea of its being so very difficult of cultivation is not altogether correct, I take the liberty of forwarding you a few notes based upon my own practice, which has been very successful.

Mr Thomson (now of Dalkeith Park Gardens), when at Wrotham Park, and Mr Cuthill of Camberwell, in years gone by grew this plant with great success; and of later date Mr Constantine of Hillingdon Park, near London, has had equal success. These have in their turn favoured the public with their mode of treatment, which appeared as simple as the treatment of any of our most popular plants, and which, after all, really is so. My own experience is corroborative of this, and I hesitate not to say that there are hundreds of plants, in very general cultivation, which require quite as much labour and greater variation of management than this Lisianthus.

Having read all that has been said by the gentlemen referred to above, and that very much to my profit, I have to a great extent followed their practice, except in a few important points. Perhaps the most important is that of getting "up" the seed, and their after-treatment during the first season of their growth. I have been told

by seedsmen that they could not get sale for the seed of this plant, simply because gardeners entertain the idea that it is something next to impossible to get it "up." But without referring to the errors generally committed on this point, I will briefly explain the method by which I have always secured a free germination.

About the first week in January I generally put up an old-fashioned hotbed of dung and leaves for the purpose of raising Melon and Cucumber plants. In this bed I also get the *Lisianthus* seed "up." The atmospheric temperature aimed at is 75° ; the bottom heat of course runs considerably above this. Towards the middle of January I sow the *Lisianthus* as follows:—A 7 or 8-inch pot is filled a third full of broken potsherds, over which is placed a layer of the fibry part of peat or loam, as the case may be. The pot is then filled up to within a quarter of an inch of the brim with a mixture of light fibry loam, and peat in equal proportions; the remaining quarter of an inch is made up of the same soil, with the addition of about a fifth part of sand; and in this case the whole is sifted through a fine sieve. On an even, but not pressed, surface of this soil the seed is sown moderately thick, after which I give the surface a gentle press with the palm of the hand. There is no covering used, and no water applied. A seed pan, 5 or 6 inches in depth, is made water tight with a bit of clay or putty, and plunged in the dung bed. In this pan the pot is placed, and then surrounded with water, and a bell-glass is placed over the seedling pot. In this position all the attention given is simply to keep the pan full of tepid water, and to wipe the bell-glass daily.

This method of supplying the seed with moisture, obviates the danger of "washing" the seeds too deeply into the soil, arising from the common way of watering. It, at the same time, prevents alternations of floods and droughts, as well as heats and colds. I have tried the plan recommended—I forget by whom—of sowing on fine silver sand, first watering the sand to give a solid surface, preventing the seed from getting imbedded beyond a proper depth. But I have found that I can get as sure a "braird" and a much more robust and healthy seedling, by the method related above.

In due time the young plants make their appearance. The bell-glass is then tilted up a little at one side to admit a little air, which is gradually increased till they have formed their first leaves, and then the bell-glass is altogether dispensed with. The seedling pot is still left in the pan of water till the plants get sufficiently large to be laid hold of, with care, by the finger and thumb. They are then "pricked off," about half-an-inch apart—and without breaking a root—into seed pans, using for soil, two parts open loam, two parts of well-decayed leaf-mould, one part of peat, and a sprinkling of charcoal dust and silver sand. After being watered through a fine rose with tepid water, they are returned to the frame, and shaded from the sun for a few days. An uniform degree of moisture is afforded them, and as soon as they have made a few leaves and before

they get at all crowded, they are potted off singly, into small 60 s. pots, using the same soil as that last named. Then they are handed over to the Melon or Cucumber frame, or in fact, anywhere where there is a moist genial heat of from 70° to 75° , plunging the pots in order the more easily to prevent them at any time from becoming too dry. A great point is the uniformity of the state of moisture at the root.

As soon as they pretty well fill these pots with their white thread-like roots, they are shifted into large 60 s. and 48 s. pots, according to the vigour of the respective plants. This shift is generally needed about the middle of June, and they are then plunged in coal ashes in any frame where there is a slight bottom heat for the time, say an old Melon or cutting frame. The glass is whitewashed over with some hot lime and skim milk, (a famous shade and always in its place,) and all the attention they get here is a daily glance in the way of sufficient water to keep them always moist at the root, and sufficient air to prevent them from "drawing." This is the best possible summer quarters for the *Lisianthus*, and I have thus grown them as freely as pots of Musk, and have had plants in 48 s. by the end of August with foliage more like that of a *Sempervivum*, and completely covering the rim of the pot and curling down its sides.

I have encroached so much on your valuable space, that I must leave the winter and after-management till some future time.

REMARKS ON THE STANDARD ROSE.

A FEW remarks on the Cultivation of the Standard Rose, and on the propriety of having the same budded upon the "Dog-Rose" stock found indigenous to Scotland as a means of securing plants hardier and better suited for cultivation "North of the Tweed," may not be uninteresting to the readers of the "Scottish Gardener."

It is very evident from the immense quantities annually imported, that the Rose is an especial favourite with the people of Scotland, as it most deservedly is with all nations and all true lovers of floral decorations. Its cultivation would also appear to be as enthusiastically and devotedly attended to as it is in any other country, however much more that country may be favoured by climate, soil, or situation, for a more successful development of the "Queen of Flowers." Still it is doubtful, from our northern position, not very favourable Rose climate, and various other circumstances, whether that success has as yet rewarded the industrious and persevering cultivator to the extent that his great care, attention, trouble, and expense, would otherwise lead him to expect.

It is my intention to offer here a few practical hints for our future guidance, which I trust, if judiciously applied, will at least advance us a step or two in the right direction.

As the stock at present in use, particularly in the formation of standards, would appear to be one of the principal stumbling-blocks to our successful cultivation, I shall in the first place make a few remarks upon the selection or choice of this necessary and ought-to-be suitable article; for upon this alone depends a great deal of our future success; for if this has been chosen deficient in quality or unsuitable for either soil or climate, which I am perfectly satisfied is too frequently the case, no after care or attention that can be bestowed by the most persevering or successful of cultivators will ever prove satisfactory for any lengthened period, however favourable great care and painstaking may make things look for a season or two.

The unsatisfactory results that have attended the efforts of many a persevering and ought-to-have-fared-better cultivator of the Standard Rose in Scotland must in a great measure be attributed to the stock on which his Roses have been worked; and cannot much be wondered at when it is taken into consideration that a very large proportion—indeed I may say nearly the whole of the Standard Roses at present cultivated in Scotland, have been either transported from the Continent or from some of the southern counties of England, and are consequently worked upon the stock that was the most readily procured in the locality from whence the plants were imported, or in the neighbourhood of where they were budded. Now, if this circumstance alone be taken into consideration by any observant cultivator, he will readily perceive how ill adapted this stock must be, removed as it no doubt originally was, from some hot and sunny bank or sheltered nook of rich dry alluvial loam on the southern shores of England or France, where an early and hereditary constitution has been acquired, badly suited, under any circumstances, to endure the rigour of our cold bleak northern winters, our light soil, and in all probability the humid atmosphere of some Highland glen, and at the same time to be the sole support of a southern bred scion, with a natural constitution much worse suited and much less able to bear the severity of the seasons that will in all likelihood fall to its share in this our northern latitude, where we cannot, under such circumstances, expect it to exist only for a few years, and then only as an unsightly and unsatisfactory effort of unsuccessful cultivation; when, had our native stock been used, results much more satisfactory would have been apparent. So satisfied are the generality of the English Rose growers of the advantages to be derived from having their Roses budded upon their native stocks in preference to having them on the French—as well in a commercial point of view as in having an article much better suited to their soil and climate—that they now rarely or ever think of cultivating plants upon the latter stock. Yet we are old enough in the English trade to recollect well when a large majority of the Standard Roses then in cultivation were annually imported from France; the same complaints of ill success being then common in England that one hears

in Scotland at the present day—viz., “we cannot get the stocks to succeed,” “we havn’t sun enough,” “the climate’s not suited,” “the soil’s not the thing,” “the buds don’t take kindly,” and so on. At the same time there were sun, soil, and climate in England sufficient to grow in almost every hedgerow stocks of the “Dog-Rose” as fine and as abundant as in France or any other country; and so we have them in Scotland at the present time, and it requires but a slight effort on the part of the Scottish Rose growers to produce on their native stocks as fine plants as ever have been imported from the South, and much better suited to their soil and climate; and one would naturally expect from the much hardier constitution of our Northern stock that a good supply of well established plants would be appreciated by our Southern friends, and I do really think would be a great boon and an advantage of some considerable importance to cultivators on both sides of the Tweed. At any rate, it is perfectly evident from the whip-cord looking stuff now annually imported from the South into Scotland that we must find some other means of supply than that of the English hedge-rows. I am aware that the English trade do still import a large amount of Standard Roses from France, but these are not for their own growing, but for the supply of customers with sorts of which they may be deficient. Of the end of these, of course they know but little, as they are generally sent off to the trade, and the trade again send them to their customers, certainly with only a chance, if they live at all, of lingering out a miserable and unsightly existence. And who can tell, perhaps in some Highland glen or on the bleak side of some Scottish mountain, where had our native stock been used instead of that imported, a much more satisfactory state of things would have been the result.

Now if we really are determined to be more successful than we have hitherto been in the cultivation of the Standard Rose, we must proceed like our brethren of the South, and work upon our native stocks. Let us secure the fine examples of the Dog-Rose, found strong and healthy in almost every county and glen; we shall then at any rate have the satisfaction of knowing that we have got that to commence with, which is of the utmost importance to our future success,—we shall have “the right stock in the right place.” No country has them in greater abundance or of finer quality, and as they are, wherever growing, only an incumbrance to the soil, proprietors will not generally object to their removal; and any expert and handy labourer, if he gets nearly the amount per hundred that is paid by the English Rose growers, will earn good money by securing them carefully and of the best quality. I had always been impressed, until convinced by ocular proof to the contrary, that Rose stocks were both scarce and indifferent in Scotland. I was led to this impression by a lengthened residence in England and a close observation of the great quantities of Standard Roses annually exported from thence to Scotland. Two years residence here has

now convinced me that no country can be better supplied, nor with a better article both for home consumption or for exportation. It requires but a determination on the part of growers to purchase none but what they are perfectly satisfied are well established plants upon native stocks. A season or two will suffice to enable them to procure an abundance from their nurserymen—an article which will prove in every way much more satisfactory than anything of the kind they have as yet been accustomed to.

In the selection of stocks for the formation of standards, more attention and knowledge of the qualities requisite in the article intended for that purpose is required than would at first sight appear necessary, and it requires some considerable amount of practice and close observation before a person can really be well acquainted with the *very* best and most suitable article for his purpose; but as a general rule very young stocks, however strong, and *very* old ones, should be carefully avoided, and those only selected that are of a medium age and of fair size, with a free corrugated bark of a greyish colour, free from side branches, and, of course, of the requisite height. In collecting them from their native habitat, great care should be taken not to have their roots dried by any lengthened exposure to the atmosphere, neither should they, under any circumstances, be exposed to the influence of frost, for such will prove almost certain death to them. Another bad practice, often resorted to by collectors when they have had their collection too long exposed and dried by the action of the atmosphere, is to immerse them in water, in fact to keep them there until they have required, by absorption, their natural plumpness. I have seldom ever found them to recover from this vile practice. By far the safest and best method is, when collecting, to have a good trench open, about two feet in depth, and constantly as they are secured let them be well covered into this, and if a little loose straw, litter, or fern is thrown over their tops so much the better; with this precaution and early planting, failures will be but few. The best season for planting is certainly early in November, but I have known them to succeed well at all seasons, from the end of October to the end of March, when care has been used and open weather chosen for the operation, but on no consideration would I allow them to be removed during frosty weather, as I believe such to be extremely detrimental to success. They will also require, previous to planting, a judicious root pruning—of this they will stand a much greater amount than one unacquainted with their nature would at first sight be inclined to risk, but as it is really necessary in their future management that their roots should be what is technically termed “kept well at home,” it is absolutely requisite that all large excrescences, bent or club roots, should be removed as close as will appear consistent with the safety of the stock. This must be done by the application of a sharp hand-bill, and by placing the roots upon a solid block of wood; they will also require to be sized, say into three sizes, according to age and strength, and cut into lengths

of about three, four, and five feet—the latter will be found quite tall enough for any ordinary purpose—very little instructions can be given as to the length at which a given stock should be cut, as that entirely depends upon the substance or solidity at which it has arrived, and can only be judged of by practice, for it is of no use planting a young stock of any great length, however stout it may appear externally, provided it has not required a sufficient amount of woody fibre for its ultimate support, for if it is very young and very stout so much more will its interior be filled up with a soft pithy substance, and so much thinner and softer will be the woody substance enclosing the same, that should it not give way the first season, it will in all likelihood in a season or two die down to the place where it has been more consolidated, and to where it ought to have been cut down in the first instance. It may as well be mentioned here that stocks of the Sweetbrier should be carefully avoided; there will also occasionally be found varieties of the Dog-Rose more or less with scented foliage, these should also, as far as possible, be avoided, for they are neither so durable nor do they “bud” so well at the same season as the varieties devoid of all scent.

The next operation will be the preparation of the soil for receiving the stocks into the nursery, and the best method of planting which shall be attended to on an early occasion.

T. M. L.

AURICULA STAGE.

BY MR G. LIGHTBODY, FALKIRK.

THE Auricula Stage, of which a drawing is now given, is made moveable. Two persons can take it down and shift it into another position in a very short time.

The front, back, and sides are each in one piece; the part to which the sashes are hinged is supported by fillets, into which it fits. The hinges are fitted with bolts, by the withdrawal of which the sashes are at once detached.

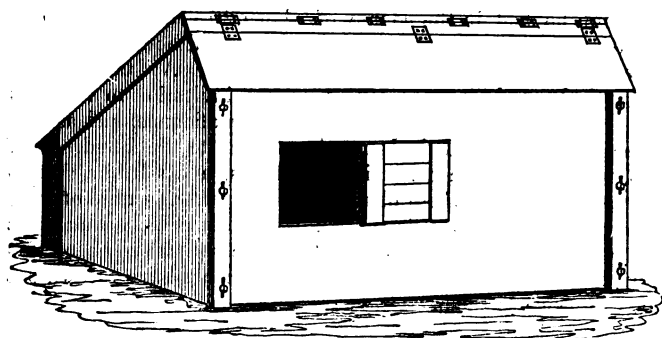
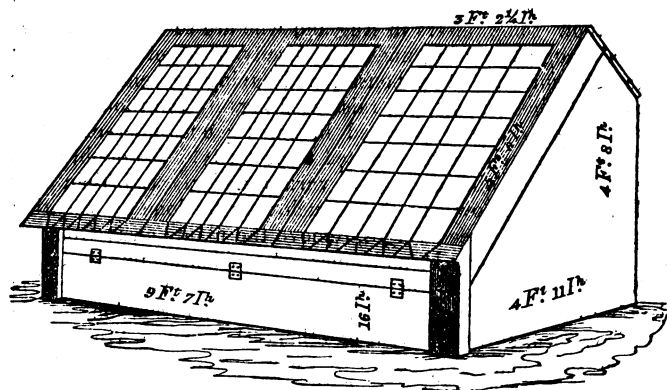
The interior is fitted with 10 shelves, rising above each other in regular gradation; each shelf holds from 19 to 20 full-sized blooming plants. The Stage is mounted on stone blocks, about 9 inches in height. This insures thorough ventilation, and raises the plants above the influence of damp during the winter months.

By the use of a stage of this description, a free circulation of air can be maintained (during any sort of weather) among the plants. In wet weather the front ventilator can be let down, and the door in the back opened. In fine weather the folding portion of the back can be turned up, and the sashes tilted to any convenient height. In fact any amount of air can be given in a stage of this description. There is one very great advantage derived from having the sashes hung at such a great angle; there is no danger

of their being blown away by wind, which is too often the case with the sashes of flat frames. Another very great advantage is, there is little to fear from drip, even with the most violent wind dashing heavy rain against the sashes. Besides, by the arrangement of the plants in the interior, they are much easier watered and kept clean, and when in bloom, every flower is distinctly seen.

These stages suit most admirably for the wintering of the Carnation. There is little fear of spot affecting them when wintered, where there is a regular circulation of air.

When the sashes are lifted, they are supported on a stout Ash pole, with an iron spike fitted to the end, which is let into an iron circle fastened with screws to the sash.



With respect to the culture of this most beautiful flower, the simple directions given in the January number of the "Scottish Gardener" for 1852, together with all the minutiae comprised in the Calendar for 1856, contain all essentials for their successful growth. I think there is no grower now alive that has tried more

experiments to excel in the culture of this flower than I have, and the conclusion that I have arrived at is, to discard all quackery with respect to composts, and to use only simple materials that are within the reach of any one. There is no fear of the *Auricula* not prospering with any grower who uses only old cow-dung, leaf-mould, and loam, properly incorporated and sweetened for compost, together with regular attention to cleanliness, a regular supply of water, plenty of air, and no lodgement of water in the centre.

Before concluding, I would urge our Northern growers to become seedling raisers; it is truly an agreeable, healthy, and exciting pursuit. I would be much pleased to see the Scottish raisers as much distinguished in the raising of superior Green, Grey, and White Edges as they have already become in the raising of fine Selfs. I know some raisers in England who are so attached to the pursuit, although labouring under the disadvantage of having their small gardens surrounded by houses, and having to send miles for their materials for compost, yet raise seedlings by the thousand; in the certainty that, if they succeed in raising one super-excellent flower, their name will be transmitted to posterity. No doubt there is more difficulty in obtaining fine varieties from seed than any other flower that I know of; but much may be done by scientific crossing. To raise Green Edges, remove the plants away from all others, so that there may be no chance of accidental impregnation from the pollen of any of the other classes. The same remark is applicable to the other classes also. I have found from long experience of my own, as well as that of others, that where Alpines are grown, no seed can be obtained that can be depended upon. An old and enthusiastic cultivator of this flower, with whom I was intimately acquainted, was a most persevering raiser of seedlings; but although he had in the course of above 20 years raised many thousands, yet they always bloomed Alpines, although the seed was ripened from his finest Greens, Greys, &c. At last he found himself at fault, and sent me a very urgent invitation to visit his bloom. When I did so, he took me into his confidence, and asking the cause of his failure, I had merely to point to the hundreds of Alpines, which he had in bloom in his borders, and tell him that so long as he had one of these plants blooming within a mile of him, he could not expect to save true seed. I earnestly hope that some of our young growers will take in hand the improvement of this most exquisite flower, and that the hints which I have thrown out may be of service to them.

HINTS TO AMATEURS ON ERECTING AND HEATING HORTICULTURAL BUILDINGS.

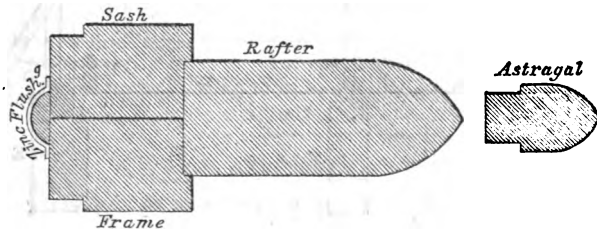
BY MR THOMSON, DALKEITH GARDENS, DALKEITH.

BELIEVING that a very numerous class of amateur gardeners would gladly advance from being the possessors of a cold frame or spare

room, wherein they keep their few greenhouse plants during the winter months to be the owners of a greenhouse, a vinery, or what is better, both combined, but for the spectre of a garden architect, an expensive hothouse builder and hot-water apparatus erector, which arises before their mind's eye, and effectually cools their budding horticultural ardour. To endeavour to release such from this sort of nightmare, is the object of the present communication.

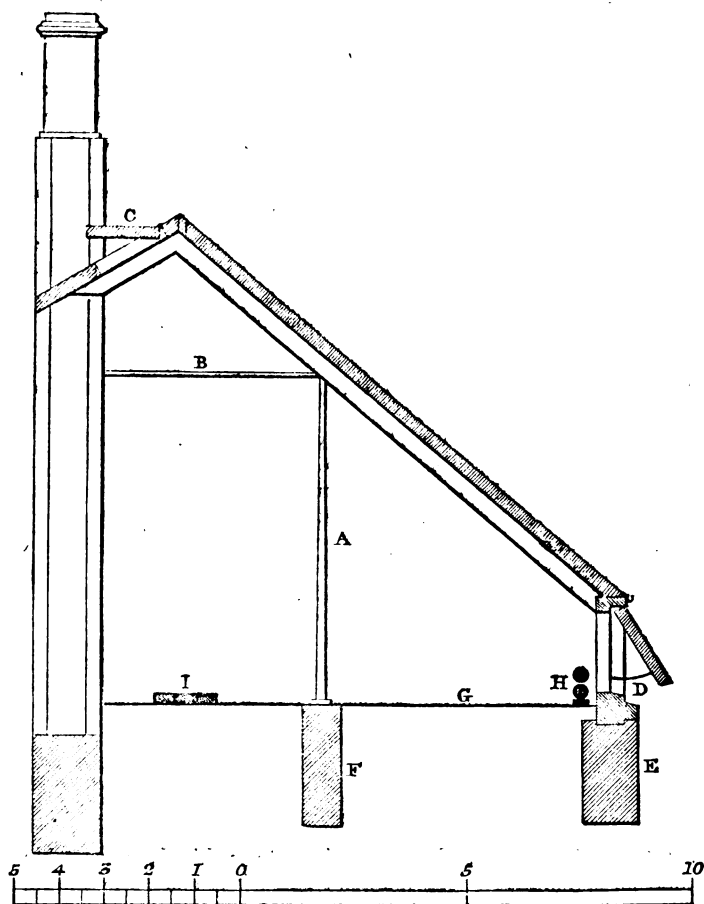
The house, of which I subjoin a section, is what is called a half-span, and experience has taught that it forms a very useful structure for a great variety of purposes. One side of it can be formed of the wall that runs along the north side of nearly every garden, at all worth the name, and on which wall either Figs or Peaches will succeed admirably. From the section of the rafter and sash frame given, it will be perceived that I deviate from the ordinary plan of constructing such houses, by making the sashes meet on the rafter which fits into a groove in the sash frames, thus effectually staying the rafters. A small bead, over which a strip of zinc is tacked, and painted, so as to render it water-tight, effectually excludes drip at the rafter—no small boon, as those who have the management of houses of ordinary construction know well. The rafters are 5 feet apart from centre to centre, consequently the lights are 5 feet wide, having 4 astragals, and the glass in squares of 11 inches by 24 inches. The house to be 11 feet wide and 10 feet high. The rafter and sash frame are shown quarter size, and describe themselves.

- A. is a cast iron pillar to support rafter.
- B. wrought iron rod screwed through the wall to stay all the building.
- C. back ventilation to be worked at once by lever.
- D. front do. do. do. do.
- E. stone or brick pier to rest the stone or wood sill on.
- F. do. do. do. cast iron pillar on.
- G. ground line.
- H. hot water pipes.
- I. hexagon iron path laid on iron rails.



I sent working plans and specifications to a highly respectable builder for a house 75 feet long, 11 feet wide, and 10 feet high, the same in every respect as the accompanying section shows, and his estimate for everything complete, except stone or brick work—

heating apparatus and iron path—was £85; the timber to be best Baltic; glass to be 16 oz. Horticultural; to have three coats of oil-paint; and sent 30 miles by rail, and be erected at his expence. The heating, allowing two rows of 4-inch pipes the whole length, will cost £15; the cast-iron path about £9. From this it will appear that a most useful range of glass, 75 feet long, admirably adapted for a great variety of purposes—as I shall show, if room can be spared in the pages of the “Scottish Gardener” next month—can be erected and heated for the sum of £115, allowing £6 for the blocks of stone on which to fix the iron supports and front sill.



A SIMPLE METHOD OF PROPAGATING THE BEDDING CALCEOLARIA.

BY MR LAING, DYSART HOUSE, DYSART.

The following simple method of propagating the Shrubby Calceolaria I have adopted for the last six years with complete success, losing but few cuttings during winter, although we have had as much as 20° of frost. Damp is much more injurious, and ought to be guarded against.

About the middle of September, or before the frost injures the plants, take off the cuttings and prepare a sufficient number of 5 or 6-inch pots; drain them thoroughly, and fill to within an inch of the mouth with leaf mould and sand in equal proportions; firm the soil, and fill up with sand; prepare the cuttings, and dibble them in; in a 6-inch pot the number of the cuttings must be regulated by the size of the foliage; if too close, they are apt to damp off. Water sparingly, and when the foliage is dry, set them in their winter's quarters, which is at the bottom of a wall facing the north under handlights.

In preparing the place for their reception, remove the soil to the width of the handlights to be used, and about 12 inches deep. Fill to near the surface with stones, covering them over with gravel or ashes, on which place the handlights. Set the pots with the cuttings inside, and fill between them with sand or fine mould which is moderately dry, to prevent damp and resist frost. When finished, put on the tops, and they require no further attention till the frost sets in, when I have them covered with Spruce branches, not to be removed until the frost is entirely gone.

This season, instead of using handlights, I have plunged all my cuttings into an old exhausted hotbed, partially shaded by trees and covered with a single mat; they have stood all the severe frosts of last month uninjured.

By the middle or end of March, they will be sufficiently rooted to be potted off into single pots; or, if room is scarce, which is generally the case about this time of the year, put two or three plants in one pot. When potted, plunge in a hotbed where there is a gentle bottom heat. Keep close till they begin to root, but be careful of steam, or they will soon damp off. Admit air as required to firm the wood, preparatory to their being placed in a cold frame to harden off for final planting out. Should greenfly make its appearance, fumigate at once, and be particularly careful to have them clear of insects before turning out into the flower beds.

I keep my old stools of *Sulphurea Splendens* at the bottom of a wall, protected by Spruce branches. Many of them die during winter; still they are worth the trouble, as they are very useful for early flowering, coming in bloom long before young plants.

The following are a few of the most useful varieties for bedding purposes, viz:—

Amplexicaule, lemon yellow.
Aurantia or Viscosissima, yellow.
Beauty of Montreal, bright light crimson.
Kayii, yellow.
King of Sardinia, rich dark crimson.
Kentish Hero, brown and yellow.

Prince of Orange, bright orange brown,
a fine variety and most abundant
bloomer.
Sulphurea Splendens, yellow, dwarf
habit.
Wellington Hero, deep yellow.

ON DEEP CULTIVATION.

BY MR HENRY BAILEY, NUNEHAM GARDENS.

There are few operations of cultural art which rank in importance with that of deep digging, and it has long been the practice of those who live by marketing the produce of their gardens, so that while I attempt to expatiate theoretically upon its advantages, it must be admitted to be a *sine qua non* with practical men.

It is not unusual for us to hear of gardens which are exhausted, or worn out. Such have, in all probability, only been dug over to the depth of a shallow spit of earth for many years, and may probably have grown the same crop for successive seasons. Let us suppose it to have been some crop requiring phosphate of lime, and it is easy to conceive the entire abstraction of that compound from the soil so treated. The crop fails and will continue to do so, till the equilibrium of vegetable food is restored. It is true that manure restores many matters which are taken from the soil, but it is also true that it is generally deficient in mineral salts, and these are placed by an all-wise Providence within man's reach, for they are largely contained in the subsoil; and it is possible by digging and commixing the soil, and by exposure to atmospheric influences, to maintain its fertility (without manure) for many years. In proof of this I may refer to the well-known fact of the Lois Weedon wheat growing and producing heavy crops for successive years. I would not be understood as deprecating the use of manure, for it is all-important in the production of fine succulent vegetables, whose flavour and crispness depend so much on its abundant use. There is this difference between farmers and gardeners, that while the latter cannot over-feed his crops, the former may do so to his ruin; and there are limits to high farming to be profitable.

When I first commenced with the garden at Nuneham, I found it in the wretched state of cultivation which I have supposed. I now trench it all over once in two years, to the depth of a yard, loosening the bottom of each trench and bringing it to the surface at the next operation. Thus, from being a most sterile plot of ground, it is now one of the most productive gardens in the country; and I have grown crops of peas for four successive years in the same ground (without any deterioration in the crop) by simply following the process of deep digging.

The arguments in favour of deep digging are many and various. The soil is an inexhaustible storehouse of food for plants, and it is ordained that man should by his observation discover, and by his industry appropriate the elements it contains. Soil is infinitely divisible, and every time it is mixed and re-divided, by the action of air fresh particles of saline and mineral ingredients are rendered soluble food for plants. Rain sinks through loose soils freely, forming passages where the air follows it, and deposits ammoniacal properties in its descent. This too is one of the reasons why deep drains are better than shallow ones, which carry off the rain water, while it is charged with ammonia.

The mechanical effect of loosening soils is very striking; the progress which plants make where they can push their tender roots without opposition, as compared with that made in densely consolidated soils needs no eulogy; it is a well appreciated fact.

I have paid much attention to allotment gardens in my lifetime, and have always been struck by the vast improvement made in tracts of poor land by the draining and thorough cultivation of the poor men. Indeed, I know hundreds of acres of the vilest land, which after being so cultivated, is worth 30s per acre, and lets for this sum.

Pope sang that—

“A little learning is a dangerous thing.”

I would say that a little digging is a dangerous thing. Dig deep.

The season is now come for the performance of such labour as is involved in my recommendation. Let me hope that the advice I give may be acted upon more generally, both by rich and poor; so will they have the satisfaction of making two blades grow where one only grew before, and thus minister largely to the wants of a rapidly increasing community.

I may be met with an objection by many that they have not strength sufficient for single digging their gardens. This sounds like a forlorn hope, but to such I would nevertheless say, try a bit, and you will find that your crop will amply repay you for any extra labour.

December 19, 1856.

SHRUBBERIES—THEIR PLANTING AND KEEPING.

BY MR R. EERRINGTON, OULTON PARK, TARPORLEY.

If any person of high taste were to ask the ordinary British gardener—What is a Shrubbery?—it is almost certain he would not receive a satisfactory answer. Of course it is a plot of ground whether belt, border, or mass, appropriated to ornamental shrubs. The prevailing fault in our old shrubberies was monotony in general appearance and a kind of chaotic confusion, wherein the rampant and coarser materials, like savage hordes on the borders of civilised countries, were allowed trespass with little hindrance, and where, of course, every good design would be more or less compromised. Even in these times, there is no want of such blemishes in gardens; they are not what we have a right to expect amidst the boasted advances of the age. Certainly the introduction of a host of valuable new shrubs and trees has imparted a freshness which, in many cases, serves to decoy the eye from any deformities which may exist; but the time approaches when such modern introductions will attain considerable size, and in many cases an awkward kind of competition will ensue.

One of the chief sources of this evil is doubtless injudicious planting; not many shrubberies are planted on what may be termed sound principles. Contract planting has been much in vogue, and this *appearing economical* has fallen so well in with the spirit of the age, as to have become very popular in latter years; to be sure, when what are called rough grounds of considerable extent are to be planted, where neither sky nor ground outline within is of very great importance, and where lots of trees and shrubs are required to give suburban plots a *countryfied* appearance, contract planting may do as well as any other. Where, however, the planting is required in the grounds of any demesne of importance, where a smack of real landscape gardening is required, where both sky and ground outlines are of high import, and trees or shrubs of conspicuous character may stand for a century or more, then something more than ordinary contract planting is requisite.

As I wish respectfully to offer a few brief remarks on style in planting, I may be permitted to refer to what we may I suppose call, "the Shrubbery;" and first observing what divisions this sweeping and somewhat indefinite term contains, proceed to examine into the characters of each department or division. And what title shall we give them, or how many? First let us say the Belt; then we have the Shrub border without flowers, the Shrub border with flowers, and lastly the groups; other forms or titles might be assumed, but these will be found the chief. The belt, a long and continuous piece of planting, is used chiefly now-a-days about suburban residences, in order to shut out disagreeable objects, or it may be no objects at all; also to produce long and concealed walks through grounds, devoid of particular interest in those parts; and above all to give an air of privacy and complete seclusion. The latter is in landscape gardening of high import, and, when rightly managed, is a source of gratification to many minds. Those belts, however, capable of receiving a touch from the hands of the artist, are not obliged to be monotonous. Belts are sometimes composed more of trees than of shrubs, and in such cases it is of much importance to endeavour to produce a good sky outline; but unluckily those higher points in landscape gardening are lamentably neglected in later days, through a rage for gaudy colours and novelties; which, although excellent coadjutors, are imperious as masters. Some people are so inordinately attached to mother earth, that they seem to forget that the sky possesses beauties, not only in colouring but outline. The satirical lines of one eminent in landscape matters, may be fresh in the memory of many of our readers:—

"With leaden eye, that loves the ground."

But to pass on. We may take next the shrub border without flowers; for

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I mean to take the subject in a consecutive way. These are not so frequently met with as formerly, and are generally insipid affairs. Perhaps, however, such may appear more in the character of groups than borders, being frequently employed to carry out turns in walks, filling up odd blanks, &c., for which no precise meaning can otherwise be found. In such cases I strongly advise parties to pay the utmost consideration to the forms and expression of superior evergreens and deciduous shrubs, allowing, yea, enabling them in most instances to gain and to retain their real character. In such situations, I need scarcely remind planters, the Hollyhock, and even the Tree Rose, will be found to add much grace to the flat-headed shrubs in many situations.

Now, a more interesting theme awaits me—The shrub border with flowers is vast scope for the decorator here; and there are at least three ways of doing the thing. There is the border, where shrubs having been planted originally as a shrubbery, it has become lean in patches; these must be filled, and, in the majority of cases, the proprietor seizes on the blank to insert his pet Fuchsias, Geraniums, Verbenas, &c. What is called the mixed flower border is much encouraged of late, and no wonder; for, when properly arranged, the plants well selected and highly cultivated, it constitutes one of the best features of a well-kept garden. This, however, I name by the way, for it is wide of my present subject. In some few gardens may be seen a background of shrubs, and perhaps trees, with a frontage appropriated principally to herbaceous plants, bulbs, &c. This style, however, is likely soon to become obsolete, for when the frontage has decayed with each returning winter, the thing looks miserable.

We come next to shrubby groups, or detached beds—the chief resort of those modern landscape gardeners whose services are so frequently in request in laying out the newly-acquired plots of the villa proprietor. These shrub plots or beds are almost universally employed to mask the sudden bends of walks, and to give an apparent reason for bold curves. Here, of course, a highly dressy character is desirable, especially as the walks approach the villa itself. Such can hardly be called shrubberies—certainly not in the old sense of the term; they are rather what the painter would call groups. Still, they must come under the original appellation for the present, for classification's sake. These, although seldom admissible in the extensive grounds attached to the old mansions of our aristocracy, are of eminent service in the grounds of the villa, where, indeed, they are indispensable. They should depend mainly on evergreens as to their permanent effect, and these should be judiciously placed—plenty of space allowed for them to develop their forms, for ultimately they must constitute some of the chief garniture of the grounds.

Flowers are, of course, admissible almost at will in these groups; and in order to continue spaces for them, I would advise planters to encourage what deciduous shrubs are intermixed with them, to run up somewhat narrow and spiry, for a relief to the flat or round headed Evergreens. Indeed the besetting sin in these groups, as they are too often found, is this obtuseness of outline, which some good people seem to delight in. Not only will light and airy deciduous shrubs afford such relief, when kept within due bounds, but such things as Hollyhocks, Tree and Pillar Roses, &c., are eminently adapted also; and their blossoms when rising above the level of the eye, appear with every move of the spectator, to embellish other and perhaps distant groups, which frequently serve as a back-ground to them.

And here might be frequently introduced with good effect, some of our old and dignified-looking herbaceous plants, which are too tall for the parterre, such as tall Phloxes, Delphiniums, Asters, Helianthus, Tiger and other tall Lilies, and several others which are in danger of being lost to the country, since so much pegging down has sprung into fashion. Care, however, should be taken that they are not permitted to become coarse and disorderly. Most of these things are not worth retaining unless they are removed and divided every second year, and fresh so

of a generous character added. Thus it is indeed that they have fallen so much into disrepute, and it is much to be lamented, for without disparaging our more recent introductions, they possess qualifications of a high order, when properly disposed of and cultivated. But there are yet many choice things of more recent introduction, and a dwarfer habit, which may legitimately find a place in the front of such groups, and as we approach the villa itself, a more exotic impress may be given them by the introduction in the month of May of perpetual Geraniums, Fuchsias, Verbenas, Calceolarias, and other discarded stock from the greenhouse, for which structure they have become too old or too woody.

I pledged myself at the commencement of this paper to offer a few remarks on what is called the keeping of grounds, connected with shrub culture; and I will now proceed to do so. I have hitherto said nothing about trees, as connected with shrubs; they have not fallen fairly within my subject; if, however, the readers of the *Scottish Gardener* approve of such discussions, I may offer my views in a future paper. As to keeping, or after-management, I must boldly maintain the opinion, that all shrubberies of whatever kind, require and deserve a revision every second year; if annually, so much the better. The management of young shrubs as to pruning, &c., should be conducted, more on the preventive than on the curative system; I would have the evil met half way if possible. This of course involves a good deal of labour, and such charge unfortunately attaches itself to every thing in gardening that must be cared for. As summer management, I must name at least the following:—The pruning of Evergreens; this is best performed about the beginning of March, and is most important—the summer pinching or stopping of gross suckers or shoots of deciduous shrubs; this is worthy more attention than is commonly bestowed on it, and a due care taken that herbaceous, annual, or exotic plants do not crowd and thereby injure choice shrubs or Evergreens. The family of Rhododendrons, now so numerous and so important to our shrub borders, require that if possible every seed pod be picked away in July, or as soon as they can be handled—much of the alternations of barrenness in the Rhododendron family proceed from the loss of power occasioned by the seed vessels. After these proceedings, we come to the fall of the leaf, and as we all know, it is customary to rake them clean away in November for decency's sake. Against this I protest not, but must at once affirm that it is not likely valuable shrubs of all kinds will continue in high condition for many years by this process. Some recompense ought to be given them in the character of dressings of liberal soil once in every three years. During the winter, the deciduous shrubs may receive attention, the bill hook and pruning knife may be exercised where needed, and of course any arrangements take place, which the ingenuity of the cultivator may suggest.

Thus, it will be seen, that even shrubberies, as such are called, demand a good deal of attention, if justice may be done them; and the grounds kept in that high dress, which the character of the age would seem to demand, and, what is of more importance still, I may add, the comforts and amenities arising therefrom to the proprietor and his family.

There are still a few more besetting sins about many pleasure grounds, as to trees and their associations, the due consideration of which would lead my pen too far for the limits of the *Scottish Gardener*.

CULTURE OF THE ALLAMANDA NERIFOLIA.

Allamandas like Ixoras are general favourites. It would, perhaps, be difficult to find a plant stove in the country, of any moderate dimensions, where these are excluded from among its inmates. Their gaudy flowers, the freedom with which they are produced, the duration of the individual blooms, as well as the long succession of flowers, all combine to make them what the plant grower delights to cultivate, and such as gain the admiration

of all beholders. The colour likewise is one that could not very well be dispensed with in our stoves, and it would, perhaps, be difficult to find a substitute for them in this respect. I have selected *nerifolia* as the subject of the following remarks, which I consider to be one of the best of the species. True, the individual flowers are not quite so large as those of *Schotti* or *cathartica*, but then, the great freedom with which they are produced, more than compensates for the little difference which may exist in point of size. A plant of *Schotti* in a pot, with twenty or thirty expanded flowers at one time, would not be considered much amiss; while *nerifolia* is capable of producing as many as a hundred and fifty or two hundred flowers, open at the same time. Indeed, the former variety is never so much at home, as when planted out at the foot of a pillar or rafter, where it can grow and flower with little or no restraint. But the very habit of *nerifolia* points it out at once as a plant for a pot.

CHOICE OF PLANTS.—In purchasing plants which will be the most ready, and will save both time and trouble, by putting you at once in possession of a plant, that will by care and attention make during the summer a fine specimen; be careful to avoid such as are “leggy,” or straggling in their growth. Rather choose a fresh struck cutting than an old stump with a small bit of green shoot at the top, such as are to be seen in some nurseries, and are not unfrequently sold for plants. It would be well if nurserymen could see it to be their interest, to keep for sale young growing stock, in place of the old stumps which purchasers so often meet with, when in search of healthy young plants. But there are some, however, who keep plants of the above description; therefore, if the buyer cannot get them at one place, he had better go at once to another, for it is little better than expense and trouble thrown away, to purchase old pot-bound “stumps” with the hope of making them into creditable specimens.

STARTING.—Supposing then that a nice young healthy plant has been obtained in a 4 or 5-inch pot, it should be allowed to stand in the stove for a few days, or a week, in order to recover the effects of the journey, more especially if it has been conveyed a considerable distance. If it has a single shoot only, the top should be pinched out at the third set of leaves. This will give from four to six shoots in the place of one; but if it has been previously stopped, and has consequently several shoots, these should be pinched at the same length as the other. If the pots can be plunged in a bottom heat of 80° or 85° with a temperature of 70° , allowing it to rise 5° in sunshine, and sink 10° at night, the buds at the axils of the leaves will swell and start into growth. As soon as this is fairly accomplished, it should be turned out of its pot, and the roots examined to see if they are healthy and numerous. The soil also should be taken into account, and if in any way unsuitable for the roots to work in, the greater part of it should be shaken away, and the plants put in some fresh soil; but if it is good, and in a sweet state, the reduction need not take place, but the plant should be at once transferred into a pot some two sizes larger than the one it has hitherto occupied. Replunge it in bottom heat, and frequently sprinkle it with tepid water, but avoid getting the soil too wet before the roots are at work and getting round the sides of the pot.

SUMMER CULTURE.—The young shoots which have been produced by the process of stopping should now be sufficiently long to have their points pinched out, to cause them to send out a second lot of laterals, which they will do if the roots are in an active healthy state. But in order to induce them to break well back, the points of the shoots should be brought down near to the rim of the pot, and arranged at as equal distances from each other as they can be got, which will make the plant look uniform, and secure a good foundation from which to raise a noble specimen. They should not be quite so freely watered immediately after stopping as usual, as a moderately dry state of the root has a tendency to prevent them from bleeding. The atmosphere should be kept moist by sprinkling the walls, floors, and other available surfaces. The temperature may advance now

that the days are much longer; from 75° to 80° , with an increase of 5° for sunshine; this will be found to grow them admirably. The night temperature should not exceed 65° , or long-jointed wood will be the consequence. A slight shade, also, in the middle of bright sunny days, will be of great service, by preventing excessive evaporation. The plants should be syringed in the afternoon, at shutting-up time, say about four o'clock; this will produce a fine growing atmosphere, and the ventilators may be re-opened at bed time, which will keep the temperature down to the desired point, and secure fine sturdy growth. But ere the young shoots have advanced more than an inch or two, they must receive another shift. Supposing them to be in 7 or 8-inch pots, one that is 10 inches in diameter may now be given. Remove all the crocks from the bottom of the old ball, injuring the roots as little as possible in the process. Replunge in bottom heat, which may range from 85° to 90° . Continue the same treatment as recommended above, as to shading, sprinkling the floors, syringing, &c.; the young shoots will then make rapid progress, and they should be fastened into their right position when long enough, by using a few stakes of suitable size and length, which will enable the grower to place every shoot so as to make it contribute to the formation of the specimen. Those on the outside should be brought down to the edge of the pot, or near it, and the others regularly and equally arranged over the top and centre of the plant. If any of the most upright of the shoots appear to be taking the lead, they should be again stopped, or they will rob the side shoots of their proper share of nutriment.

MATURING THE GROWTH.—As the month of August leaves us, we must consider that the growing period is come to a close, and that our Allamandas have made sufficient wood for the season. Henceforth, through the autumn, let the main object be to thoroughly ripen that which is made, rather than encourage the plants to make further progress. In fact, the sooner they stop growing now, the better. This should be accomplished by keeping the atmosphere much drier than it has been, by discontinuing the various modes of applying moisture; but this should not be done too suddenly, or the plants would receive a check thereby. Any shade that may have been used should now be discontinued, as the more sun they can get the better will the wood be ripened. Let this be accompanied with a due admission of air on all favourable occasions. During this stage of the progress, the temperature may be kept about 60° night, 72° day, with 7° additional in bright weather. The pots should now be raised about half-way out of the plunging material, supposing they have been sunk up to the rim of the pot. With this treatment continued through the month of September, the wood will become consolidated, and the growing tendency completely checked.

RESTING.—Through the dark winter months, they should be kept as quiet as possible, and only just sufficient water given to keep them from flagging; and this should be accompanied by a moderately low temperature—say 10° below that specified above, the object being to prevent them from growing before the spring of the year. Admit air when it can be done safely, but do not expose the plants to cold frosty winds at any time. Thus proceed through the winter until the time comes round again for re-starting them into growth.

SOIL.—No plant will thrive, whatever may be the mode of culture, unless the soil in which it grows is such as is suitable for it. If the roots be in an unfavourable medium, they cannot supply the branches with that amount of nourishment which they require; consequently the plants assume a pale, sickly appearance, and the bottom leaves are continually turning yellow and falling off. Loam that is full of fibre—turf, in fact—cut from a sheep pasture or some such place, and laid in a heap for twelve months, two parts; fibrous peat, one part; leaf mould and very rotten dung, one part, with plenty of sand to keep it open and porous. The pots should be well drained, to carry off the superfluous water, and to keep the soil sweet and healthy.

RE-STARTING.—I would recommend that every grower ought to have at

least two plants, and as many more as he thinks fit, so that he may start them at different times, and so secure a long succession of flowers. The first plants, then, should be placed in growing circumstances by the middle of January. Remove the surface soil, and give a good top-dressing of fresh compost, such as that recommended above. Plunge them in a gentle bottom heat, with a temperature of 60° to 65° ; water freely with tepid water, and once a week with liquid manure. They will quickly be on the move, but do not hurry them too much. A gradual increase of heat may be given as the days lengthen. They will show bloom at every end, and will be in full flower by the middle of March. Remove any young shoots that may start from among the flowers, which they are apt to make, as these would only rob the flowers if left. I have a plant so treated, and it is now in full bloom (April 9) and has been so for the last three weeks, having eight, ten, or a dozen flowers open at the same time on a single end, beside the buds that have yet to expand. The second plant should be cut back about the beginning of February. Shorten every shoot, leaving only a few eyes at the bottom of each. Plunge the pot in, as directed for No. 1, but keep moderately dry until the buds have fairly broken. The plants should be then turned out of their pots, and all the outside of the old ball removed, and then placed again in a pot of the same size as that from which it came. Let it be thoroughly clean and well drained. Place the plant in the middle, and fill in the fresh soil, making it moderately firm round the sides of the ball. The plant must now be encouraged to grow by placing it in top and bottom heat.

AFTER CULTURE.—When the young shoots have grown sufficiently to have made two pair or sets of leaves, the points should be pinched out. This will give about three shoots for one, and by the time these have reached the length of 4 or 5 inches, the pots will be full of white healthy roots. Get some soil mixed and placed where it will become of the same temperature as that in which the roots are now placed, and then transfer the plants into their blooming pots; these should be 15 inches in diameter. The future culture will in no wise differ from that of the previous summer, shading, wetting the floors, syringing, &c. By attention to the arrangement of the shoots, to place them so as to set them off to the best advantage, at the same time see that the plants are uniform—all sides alike, and by the beginning or middle of June you will have a splendid specimen with hundreds of showy blossoms, such as will gain the admiration of all who see it. An occasional application of liquid manure will keep up a long succession of bloom.

When the first show is over, the plants will send forth young shoots from the tops of those already existing, and these will furnish another mass of yellow on their summits after having grown about a foot long. Thus with two plants, you may have a succession of flowers from March till September.

When one has done blooming, it should be cut down, and after having broken, be reduced in the ball, fresh potted, and encouraged to make strong sturdy growth before the winter sets in, which should be well ripened as recommended in the directions for the first season, and after having rested, may be started again in the same way as before. The same plants will last a number of years, by greatly reducing the ball annually and giving them fresh soil to work in. When, however, it may be thought desirable to begin again with young plants, they may be struck from cuttings without buying a second time.

PROPAGATION.—I have struck cuttings by taking the short stubby side shoots, and preparing them in the usual way, but perhaps the best plan is to get them with a heel; cut it smoothly over; put it in silver sand or very sandy peat; plunge the pot or pan in a brisk bottom heat; cover them with a bell-glass, and sprinkle them frequently, and they will root in five or six weeks, when they may be potted off, and subjected to the treatment detailed above.

T. J.

Manchester.

ON HEATING HORTICULTURAL BUILDINGS.

BY MR SHEARER, YESTER GARDENS, GIFFORD.

In my last Paper I endeavoured to explain the principles on which the fire acted in combustion. It will now be necessary to notice the boiler, as the fire is applied to it. This, I confess, is attended with many difficulties. Few subjects have engaged the attention of scientific men more than this has, and many ingenious devices have come forth, and been held up as perfect. But still there are defects—if one object is gained, another of equal importance is lost in the many arrangements that have been made. It would be quite out of place in such a work as the *Scottish Gardener* to enter into an examination of all the plans that have been before the public. I will therefore only notice a few of those with which I am acquainted and have had experience with. I do not anticipate that all will agree in what I say on this subject; each will have his favourite boiler, I have no doubt. I shall only state candidly my own opinions; others, of course, can either reject or admit the arguments brought forth for each.

It will however be admitted by all that the boiler whose construction admits the greatest amount of fire to act, and absorb most heat from the fire, will be the best. But the question arises—How is this to be accomplished? One says, by making the fire pass in a horizontal direction along the boiler, either below and along the sides and top, or in flues several times through it; while another says, allow the fire to act on a great surface in a perpendicular manner. Theoretically and practically, both systems have their advantages; and therefore both have their advocates. I will therefore notice one or two of both, and take those as examples which are advertised in the papers of the day. And I notice, first, the system of Cottam & Hallam, who were among the first to display any ingenuity in the construction of the boiler. Theirs is an arch one, with the fireplace formed in the brick-work, and the arch above formed by the cast-iron boiler; the fire is split at the further end, and passes along on each side of the boiler. From the flatness of the latter, the fire can have little effect; the heat will be given to the brick-work above forming the flue instead of the boiler. Baily's boiler is much the same; but, in my opinion, better. Kerslake's universal flue boiler belongs to the horizontal class, and from the design would seem a powerful one. It has been much used in the neighbourhood of Exeter; there is an immense surface exposed to the fire.

Among the perpendicular ones, I would notice first Messrs Weeks' tubular one, which, to look at, would certainly give the idea that it was a powerful one; still, having had experience of it, I cannot recommend it, more especially when used in Scotland with our coal. The tubes get so completely covered with soot, it is very difficult to heat it, unless the fire is going very strong, so as to consume all the soot. No doubt there is a way to clean them, still it is too much to expect of gardeners, being so much occupied with other things, to have to attend so much as it would require. The tubes forming the fire bars too, are a serious objection, from their liability to wear with the action of the fire and stoking, and it is no easy matter to repair it.

Burbidge and Healy's boiler has been greatly used—from the simplicity of setting, I think, more than anything else. A case where this boiler was used which came to my knowledge, gave me a very poor opinion of it. After being set, and the fire lighted, a zinc chimney-can placed for ornament, very soon melted away, showing the great amount of heat mis-applied; in fact, all perpendicular boilers have the same fault. Consumption of fuel cannot go on, and give heat to the boiler, from the fire coming in contact with the colder sides of the boiler, the very place where the heat should be greatest; while the strongest heat is in the centre, and of course lost in the chimney. This is not the case in horizontal ones, and should not be lost sight of in the construction of boilers.

Rogers' conical boiler has some good points; still, it is very troublesome to work, although paraded with the quality of requiring little attention. I do

not consider it adapted, where much is required of it. I might notice, also, Stephenson's cylindrical, an ingeniously constructed one—Garton and Jarvis' horizontal cylinder—where the fire is placed in the centre, and the flame passes round the outside of cylinder, exposing all to the fire—Samson's spiral one, named from the way the fire is conducted round in spiral flues—Spillers' boiler, a horizontal one where the fire passes through a number of small tubes, surrounded with water as in the locomotive boiler: no doubt a good one, but it must be expensive from the construction; and the number of small tubes to be effective, should often be freed from soot, or it will lose much heat. It would be endless, and quite out of place here, to discuss the merits of all the inventions that have come before the public lately. But I cannot pass one which has been invented by Mr Thomson, gardener, at Dalkeith Palace, which I have seen built in. The drawings he has sent out, however, do not do it justice. Mr Thomson and the manufacturer are certainly entitled to the thanks and patronage of all who are interested in Horticultural pursuits, in giving, in my opinion, a good and a cheap boiler. It is easily set, and from the action of the fire, the brick work can be little affected by the heat. It can be built in so as to have a large space for fuel—a great consideration, when using our Scotch coals. It belongs to the horizontal class, although it has no new principle in it, and differs only from others in having three tubes, seven inches in diameter, where the flame passes through, instead of a number of small tubes as in others. Yet, although there is no greater surface exposed to the action of the flame than in some others, still, from its simplicity and the ready access to the flues, I have a high opinion of it, and hope it may prove all that Mr Thomson expects of it.

I am truly glad that Mr T.'s great experience has led him to adopt what I shall term the one-boiler system of heating, and do away with that absurd system of a separate boiler to each house. It is perfectly astonishing to me that it has continued so long. It can only be accounted for in the little attention that gardeners themselves have paid to heating by hot water, and allowing persons to erect them who knew nothing of what gardeners required and had to contend with; and until gardeners bestir themselves, the same evils will continue.

Just fancy what usage has led us to. In some places may be seen a fire to each house in a range of six or seven, while one boiler, or at most two, would heat the whole, for whatever purpose required, with far less labour and a great saving of fuel; and there is only one argument, that I am aware of, can be used against the one-boiler system, namely, the danger of anything going wrong with the boiler, which might be attended with serious consequences. To avoid this, which I admit may take place, put in two boilers beside each other; they could be both used in severe weather, and have means to shut off and remove one while it might require repair, and the other do the work. In that case there would be no danger; and the one-boiler system is entitled to this, as it would still be cheaper, and a person can surely keep in better order one or two fires than twelve or twenty. The very buildings required for each fire are a nuisance which should not be tolerated.

The system we have adopted here is to heat several houses by one boiler, which is the old saddle one, made of malleable iron, set and built in as recommended by Hood in his Treatise on Heating. It has its apparent faults, I admit; but I question if it is superseded yet, taking everything into account. I am no advocate for cast-iron boilers in any shape or form, from their liability to crack when least expected, and while no one can be blamed. It is well known that cast-iron, like glass, will not contract and expand as malleable iron will, and when the fire is strong, and the return water is of a low temperature, entering the boiler, the one side of the boiler is expanding with the heat, and the other contracting—when the extremes of heat and cold are great, it will not stand; at all events, it is a risk I would not like. I grant that a great number have stood well, and after the first severe trial, they have not so much chance to go; there may also be defects in the casting which

escape detection, which are frequently seen in cast iron pipes: they may stand a pressure with the hydraulic press of 300 or 400 lbs. to the square inch, it being a horizontal pressure, and yet give way with the application of heat, as the metal in that case expands longitudinally. The boilers here are 8 feet long, 1 foot 3 inches wide, 1 foot 6 inches high. One of them heats 2 vineries 30 feet long each, and 16 feet wide, one Peach house, and the chambers of the two vineries, and a Mushroom house—in all, 800 feet of 4-inch pipes. Another heats a span-roof stove, 24 feet long, and 20 feet wide greenhouse, 40 feet long, and 20 feet wide; four pits, 32 feet long each, and 9 feet 6 inches wide, with bottom heat for two of them; four pits, 32 feet long, 4 feet wide, with 2-inch pipes for bottom heat;—in all, 356 feet of 4-inch pipe, 320 feet of 3-inch, and 428 feet of 2-inch; being twelve different departments heated with one fire and one boiler. Each can be heated separately, or altogether, as required. Our other boiler heats two span-roofed house, 32 feet long and 9 feet wide each, with bottom heat likewise. The same boiler would heat three or four more. In two of the pits we grow Orchids and Cucumbers all winter; in the other, French Beans, Strawberries, and Melons in summer. In another we keep Geraniums, &c.; and in the other Azaleas, Cinerarias, &c. In the four pits with bottom heat only, we force Sea-Kale and Asparagus; in the two span-roof houses we have had Grapes ripe in the beginning of March, in pots; in the larger vineries we commence forcing in February.

Having plants in each of the houses all winter, the fires are never let out, we have thus 22 different departments heated with three boilers. I leave it to the decision of all practical men who know anything about the trouble it takes to keep 12 to 22 fires going, when the same amount can be done with a little ingenuity and perfect security. I am no believer in those boilers and apparatus that are set forth as requiring attendance only every 12 or 24 hours; they only show their ignorance of what is required by the gardener. Such statements are no guarantee to any one who knows anything of the subject. It is all humbug; tended only to mislead. It carries contradiction in the very face of it. Surely it is well known that in 12 hours a change of 10 or 12 degrees of temperature will take place; and no man can arrange his fire to counteract that without stirring it up. If it were a dwelling-house, where the radiation from the pipes were equal, then the fire might be made to keep a long time; but it is absurd to maintain that it can be done in the forcing of flowers and fruit. We have another no less fallacious statement made by boiler inventors, viz., that they are capable of heating so many thousand feet of pipe. It is no test of the power of a boiler, as it depends entirely upon the place where the pipes are placed, one may be where radiation may be going on at a rapid rate, another, where there is very little; one may be surrounded by good conducting objects, while the other is the reverse; nay more, the colour of the pipes will even make a difference. Unfortunately we have no easy or practicable method of ascertaining the heating power of any boiler. We are therefore left to judge of their power when they are fairly tried, and to the cost of many who have tried them.

I shall conclude this subject in another number, with some remarks on the circulation of the water, laying the pipes, &c.

THE CULTURE OF THE VERBENA IN POTS.

BY A. M'KEITH, WEST COATES NURSERY, EDINBURGH.

Few plants afford so much delight to the florist as the elegant Verbena—few reward a little care with more pleasure. It requires but a short acquaintance to appreciate its many charming qualities. Knowing that its beautiful flowers are indispensable in the smallest as well as the largest flower garden, a few hints as to its flowering in pots may not be here out of place, as they form objects of no mean attraction for decorating the greenhouse in

summer and autumn, and also supplying out flowers. Their continuous blooming, the ease with which they are managed, render them special favourites to all lovers of flowers.

For early blooming, select healthy plants, rooted in August, putting them singly in pots, 3 inches in diameter. Place them in a close, cold frame for a week, slightly shading during the heat of the day; then gradually expose to air and light; let them be well hardened off before winter sets in, as this prevents their damping off so easily. About the beginning of February, shift into pots 5 inches in diameter, pinching each shoot to three eyes, always observing to keep them free from mildew and greenfly—for the former, dusting with sulphur, the latter by fumigating with tobacco. Water sparingly at this season, but great care must be taken that none suffer from want of it. Towards the middle of March give them their final shift; if large specimens are wanted, into pots 8 to 12 inches, or according to convenience. Give them the full benefit of air on all possible occasions, and as near the glass as safety will permit. This tends to keep them dwarf, bushy, and healthy. At this stage the more vigorous shoots may still be pinched back, so as to keep the entire plant nearly uniform. The method we adopt here for training is flat, upright trellises made of wire, and painted green; the blooms being judiciously arranged over the surface of the trellis, all showing one way, and dispersed here and there among the other plants in the house. They have a very pleasant effect.

To have a succession of bloom, select strong plants, rooted in March, and treat as above. During April and up to their time of coming into bloom, let them be well syringed twice a-week with rain water, and as near the temperature of the house as possible. This will greatly add to their health and vigour, and will be the sure means of keeping down red spider, rust, &c. About the latter end of May they will be coming into bloom; let them be neatly tied in. This greatly aids their beauty and display. To those that may be cramped for want of pot-room, give weak liquid manure—either sheep droppings or guano in a semi-transparent state, and instead of giving twice a-week, as is commonly done, let them have it as a regular course of watering. This I have found, after many years' practical experience, to answer my most sanguine expectations. By attending to the above simple mode, the most inexperienced cannot fail of success. The following compost we use for our final shift in a rough state:—Equal parts turfy loam, leaf mould, manure, and gritty sand, well decomposed and incorporated for at least six months previous to using.

The following 24 varieties are all well suited for pot culture, and also beautifully diversified in colour:—

Admiral Dundas
Auguste Mauget
Brilliant de Vaise
Crimson Perfection
Esther
Geant des Batailles
General Simpson
Gloire de France
Loveliness
Lord Raglan
Magnum Bonum
Miss Trotter

Madame Aimie
Madame Plantamour
Madame Picolomini
Madame Restauri
Madame Lamoriciere
Mrs Holford
Mrs Woodroffe
Nelly
Noel
Reine Victoria
Reine des Amazones
Rose of England

LUCULIA GRATISSIMA.

BY MR ARCHIBALD HENDERSON, LATE GARDENER, SPRING GROVE, WORCESTER.

From the period of this plant's introduction to the present, few, indeed, are the specimens that have adorned our Greenhouses and Conservatories. Many have tried its culture and failed, discarding it from their collections as

a useless and unworthy subject. Why should we thus reason and delude ourselves, when there are living witnesses, annually arrayed in elegance and splendour? As a winter flowering plant, it has few equals, if not unrivalled, not only from its profusion of bloom, but as one single truss of its deep pink flowers will suffuse the whole atmosphere of the house with rich and pleasing odours, the inhaling of which will refresh and invigorate animation. Among Camélias, Epacrises, &c., the *Luculia* is altogether indispensable, flowering at the same period, and overflowing with the defects of the former, and beautiful tribe of plants. Let it then take the position it so justly merits. First, in striking from cuttings, select shoots moderately firm; about the end of April, insert in pots well drained, with the usual mixture for hardwood cuttings—place in pots, on the interior of a forcing Vinery, covering with a hand-glass; supplying moisture by sprinkling the border inside the glass in a morning, and tilting the glass for half-an-hour in the evening after syringing, which admits of atmosphere charged with moisture. The vines afford sufficient shade when started into growth. Pinch immediately when a second shoot is gained, then, for potting—which will be about the end of July—soil, $\frac{2}{3}$ fibrous peat, $\frac{1}{3}$ light sandy loam, adding a little leaf soil, and silver sand, in a moist state, securing perfect drainage, without which, success is out of the question—observing this throughout all the various stages of potting, as one of the most essential points, in the future work. Pot singly into 3 inch pots, rather loose than otherwise. Many evils will arise from hard potting in a young state, frequently ending in the death of specimen plants. Place them in a cold pit, plunging in ashes, shading for a few days to prevent rapid evaporation; sprinkle the interior frequently; syringe lightly in afternoons, gradually inuring to the noon-day sun—they will now push freely. Pinch whenever a joint is gained; do not exceed the out-door temperature more than 5° . Shift again about the first of September into a size larger—drainage and soil as before. Put them again into a pit close to the glass, attending carefully to watering, pinching, &c. They may remain here with safety until the first week of October. Then take advantage of a light airy place on the front shelf of the greenhouse, or any other convenient but suitable place; temperature about 40° . This I consider very essential for the future well-being of the plants. Tie them out carefully; keep them moving gently through the winter, rather dry than otherwise. March will awaken them to renewed energy. Remove them again into a pit close to the glass. Temperature, 45° . Destroy greenfly if making their appearance, which can easily be done by syringing or fumigating; water thoroughly when dry; increase the atmospheric moisture, and advance the temperature with the season, shifting again in the middle of April into an 8-inch pot. Pinching having been attended to, now discontinue it for the season, in order to form their flower buds. Arrange the shoots, carefully tie; the plant of itself should represent a half-globe. Syringe in the afternoons; air freely to secure a healthy and robust growth; sprinkle the interior to counteract excessive evaporation, above all, keep the roots in a moist healthy state. About the end of August all will have set their buds. This done, air more freely than before, removing to the show house. About Christmas they will be in flower. The demands upon the roots being great, give a copious supply of water with a little soot mixed, which will greatly add to the depth of colour in the flower, each having 12 to 18 trusses, and each forming a bouquet of itself. Such indulgence will excite energy and perseverance. Where cut flowers are in request, the plants will have admitted a severe cutting. If any have escaped then, cut immediately; encourage the growth; for the last time, pinch when the shoots will allow, which will be about the end of April, giving now a liberal shift, in nearly equal parts of turfy peat and loam, sand and leaf-mould, as formerly, removing to a pit, which is still preferable, to larger structures, both for growth and setting their buds. Treat as in previous season one-half of the stock, reserving the remainder for a succession, which is done

in August. When the buds are set, place them out of doors until the general housing of greenhouse plants, affording protection against heavy rains; by this means the season of bloom may be prolonged from three to five months, which is a consideration of some magnitude, especially in the winter months, from December to April, when flowers are appreciated to their full value. In all cases of potting, let the ball be moist, and the soil nearly of the same texture. After the second flowering, pot in ten days, as a matter of course. The plant ensuring cutting back as the previous year. All of them, under those circumstances, have now a good foundation for the future work. We will now take leave of all staking and tying—this, for the future, coming under the head of cutting back, which is infinitely better than composing plants of stakes and matings. The shoots having been grown into their proper position they will continue to do so without further trouble—strictly adhering to watering, potting, and cutting back annually, especially to the temperature, as the latter is the chief stumbling-block in the way of success. Never allow a higher temperature than the greenhouse throughout the various stages of their growth, having frequently seen the attempt to grow them in a higher temperature, nay, even in a stove, the precursor to death and to the rubbish heap. A few years diligent attention to those remarks will get up specimens from 6 to 8 feet high, and nearly as many through. If the plants get larger than convenient for shifting, reduce the ball, root prune, and pot into two sizes smaller, keeping them in a close, moist atmosphere, supplying their more immediate wants; this the mutilated roots are unable to perform. By this means specimens may be kept for many years in the most perfect state of health, without being unmanageable. I have frequently observed the most injurious effects from fire heat—in one solitary night changing from a deep green to that of a light sickly colour, at the same time the thermometer not exceeding 38° , only 6° above freezing; the thermometer out of doors at that period was 15° , consequently indicating 17° of frost. In two instances this plant has endured the temperature at 30° , being 2° below freezing, without any apparent effect, and in full bloom at the time. The only precaution in our power at the time was shading it from the direct rays of the sun. In severe weather the thermometer should not exceed 34° , when it will do well. From my own observations, I conclude that the *Luculia* is much hardier than generally believed. However, this plant, from its natural habit, appears better suited for planting out in greenhouse and conservatory borders than for pot culture. In this instance, as in the former, secure perfect drainage; compost equal parts—turfy loam and fibrous peat—mix a little sand when planting, merely to give a start; choosing healthy and well established plants; planting in April or May. By attention to their wants, which must be as consistent to the former as circumstances will allow, the only means of keeping them compact in habit is to apply the knife freely, which is preferable to pinching, as in the planting-out system, they grow more freely—pinching only giving part of the season for growth—cutting back the whole of the season which is security for flowering. This plant as I before stated, delights in abundance of water when flowering—hence the necessity for efficient drainage. Its culture when planted out is simply giving water, cutting back, and soil to suit. In a miscellaneous collection, the temperature may not suit at all times, but adhere to the remarks for pot culture, as circumstances will admit. I will here give the dimensions of one lately under my care—16 feet high, and 39 feet in circumference, producing annually upwards of 800 trusses of bloom, varying from 6 to 11 inches through. The magnificence of such a specimen in bloom is easier conceived than described. I trust ere long the present exceptions will form the future rule, when many structures will be ornamented with such specimens.

CULTIVATION OF THE DAHLIA.

BY MR GEORGE GOODALL, PINKHILL NURSERY.

As Dahlia competitions now excite great interest, almost every town having its Annual Show, a few hints may not be out of place to the amateur readers of the *Scottish Gardener*.

Dahlias succeed best in an open situation, and sheltered from high winds; the ground should be well manured, trenched, and laid up in ridges, so as to have the benefit of the winter's frost; in spring work the ground well, so that the manure may be mixed through the soil. The roots should be put on a hotbed amongst leaf-mould, or in boxes in a stove, to start, about the beginning of March; and cuttings taken off as soon as they are ready. When rooted, re-pot them into small pots, using good rich soil. They should be kept as near the glass as possible, and not allowed to draw. Re-pot occasionally, so as to have a good stubby plant in an 8-inch pot, by the last week of May; when, if the weather be favourable, they should be planted out, allowing a good space between—about 6 feet between each row, and 4 feet in the row. As the plants begin to grow, the top should be pinched off with the finger and thumb, especially of all the early flowering varieties, to prevent them coming too early in bloom. Each plant should have five stakes; and wherever a good shoot appears, an additional stake should be given. Thinning must be done with care, according to variety. The small flowering sorts, such as Ruby-Queen and Annie Rawlings, must be well thinned out; and large flowering sorts, such as Lord Palmerston and Pre-eminent, should be a little thinned, or the blooms grow large and coarse. They should be regularly attended to; never allowing the plants to get bushy, as nothing is more injurious than violent cutting in dry weather. Give a good watering two or three times a-week; and syringing over the foliage every night is of great advantage. About the middle of July give a good topdressing of well-made manure; and as the season advances, and the plants coming into bloom, liquid manure may be given once in the week with advantage. For this purpose, sheep droppings put in water, and allowed to steep for two or three days before application, answer very well.

In growing for exhibition, the buds require to be thinned out, which should be done carefully, so as to have a continuance of good blooms. The small flowering varieties, and such as Rachel Rawlings, that have so many buds, may be done freely, so as not to allow too many blooms at one time. Large flowering sorts require very little, or they come too large, which is often followed with coarseness. By following the above simple method, I have found them do exceedingly well.

The following twenty-four show, and twelve fancy varieties, will be found very useful for exhibition purposes:—

SHOW.

Admiral Dundas (Lawton).
Annie (Rawlings).
Beauty of Slough (Bragg).
Be-sie (Turner).
Climax (Harrison).
Coosack (Fellowes).
Duchess of Wellington (Turner).
Duke of Wellington (Drummond).
Empress (Proctor).
Eclipse (Wheeler).
Fanny Keynes (Keynes).
Grand Sultan (Turner).

Glenlyon (Fellowes).
Lollipop (Holmes).
Lady Folkestone (Keynes).
Lord Palmerston (Holmes).
Lord Bath (Wheeler).
Malvina (Howard).
Perfection (Keynes).
Pre-eminent (Fellowes).
Rachel Rawlings (Keynes).
Ruby Queen (Keynes).
Sir C. Napier (Hale).
White Standard (Brittle).

FANCIES.

Alliance (Perry).
Butterfly (Green).
Baron Alderson (Perry).
Comet (Keynes).
Enchantress (Alexander).
Emperatrice Eugene (Alexander).

Inimitable (Salter).
Merveille (Milleiz).
Miss Frampton (Rawlings).
Miss Ward (Turner).
Pigeon (De Kniff).
Topsy (Keynes).

ORCHARD AND FRUIT REMINISCENCES.

APPLES.

As the various kinds of fruit are now becoming more and more extensively cultivated than formerly, and as every season brings forth its various new varieties, the planter is sometimes very much puzzled as to what varieties he is to purchase. Sometimes, as I have known the case to be, when the plant that he might have selected out of some catalogue with a very high sounding description and character, worthy of the very best of its variety fruits, it has proved comparatively worthless.

Growing a great variety of the different varieties of fruit, and being able to test the newer varieties against the older ones, perhaps a few notes on what I have tested, may be some guide to a part of your readers. But before I begin with my description, I will state that I grow the greatest part of my trees as pyramids, and it is a plan I would strongly recommend to all who would wish to make the most of their ground; they are situated on a gentle slope to the south-east, the soil being a rich strong red loam, and no trees can be more luxuriant, and bring better crops than they.

Alfriston.—This is a late Apple suitable for kitchen purposes, very large, a good cropper, and will keep till the latter end of February.

Bess Poole.—This is one that is either suitable for table or kitchen use, being a very good flavour and keeps well; the chief fault to be found with it is its being so long before it comes into a bearing state. There is a variety called the *New Bess Poole*, a seedling from the former, which is a larger fruit, and comes into cropping much earlier. The latter I would recommend as being the best.

Blenheim Orange or Woodstock Pippin.—This I have grown under the two names, I believe the former to be the proper one; it is a noble Apple, and about Christmas time it is almost as good as any variety that can be grown; the form and general appearance makes it a great favourite at horticultural exhibitions.

Brabant belle fleur is an excellent late variety, and a really splendid cooker.

Court Pendu Plat.—This is a splendid table fruit, a wonderful cropper, and will keep till February.

Dumelow's Seedling or Normanton Wonder.—This is a variety that is generally known by the latter name, and is so well known, that we need only say that it is about the best late Apple for culinary purposes that we grow.

Emperor Alexander.—This is one of the most beautiful fruits that can be grown, it is used for cooking, for which purpose it is very good, and is a variety that must always command the highest price in the market; it is best planted on light soils, for on wet and clayey land it is very subject to the canker.

Eve Apple.—This is an old variety, and likewise a great favourite for dessert; it is not with me a good cropper, but there is an *Improved Eve* which I have fruited three years from the bud, showing its great advantage over the older varieties, and being quite equal to it in flavour.

Gravenstein is a very large and rich juicy fruit; it is in its best about the latter end of October, and is a first-rate culinary Apple.

Lord Lennox.—This is a splendid-looking Apple, and as good as it looks; the appearance will always recommend it for a market fruit, it being of a bright scarlet. The plants are well adapted to be grown as pyramids, and ought to be in every collection.

Lord Suffield.—Of this variety I have repeatedly had plants two years from the bud, and only about 2 feet in height, with a dozen fruit on each, having the appearance of a rope of Onions; and on larger plants I have had

specimens which have measured nearly 14 inches in circumference, and weighed a pound each; it is quite as early as the old Keswick Codlin, which variety must yield the palm to its first-rate qualities as a culinary fruit.

Leicester Burton Pippin.—This is a seedling from the Manks Codlin, of a much freer growth than its parent, and an earlier cropper.

Mannington Pearmain.—This variety was raised in Herefordshire; it is a first-rate dessert Apple, quite as good as our old favourite Ribston Pippin, and not like that variety, suffering so much from the canker: it is a variety that can be highly recommended on account of its coming into bearing so very early.

Pearmain (Bradley).—This is a variety that was raised somewhere near to Newark, a splendid dessert Apple, and one that can be highly recommended.

Pearmain (Pikes).—This is a wonderful cropping Apple, very handsome, and will do either for cooking or eating; the habit of the plant is pyramidal, which gives it a splendid appearance. I would recommend this variety to any one who is desirous of having an early cropping first-rate sort.

Premier.—This is a sort that has not yet become generally known; it is of a Pearmain shape, and a bright scarlet, next the sun of fine flavour, and when more known, I have not the least doubt will be much cultivated.

Queen Caroline, Brown's Seedling, Favourite, or Spencer's Seedling.—I have had this sort from different nurserymen under these different names, but I believe the first is the original. It is a variety that every one who has a spare yard of ground ought to grow. It is ready for use about October or beginning of November, and is of a bright golden colour when ripe.

Celini.—This a very good kitchen fruit, of large size, and a wonderful cropper.

Sturmer Pippin.—This is an excellent table Apple. It is not its appearance that recommends it to notice; it is its being so very late, keeping almost till Apples come again. A very prolific variety.

I have also many of the American varieties, which I have not yet fruited; but a description of which and how they succeed in this country, I will give as soon as they do. The varieties I have described are such as can be recommended.

R. S.

AMATEURS' AND COTTAGERS' GARDEN.

I am most glad to learn that the *Scottish Gardener* begins the year with a distinct recognition of the claims and wants of the amateur and cottager. It may with all justice be said that the former named class have it peculiarly in their power to help and stimulate the latter, and I trust that—largely through this instrumentality—the *Scottish Gardener* may have its pages scanned even by the humble cottager; thus helping on the happy day, when Scotia's sons of toil will rather spend their mite in the purchase of seeds and flowers, and their leisure moments in cultivating the same, than devote them to other too common gratifications, which stunt and debase the mind. Would it not be a pleasing and desirable sign of the times to see the cottager partaking of the enthusiastic spirit of Gardening to a very much greater extent than yet exists. With well directed and persevering efforts, their achievements would astonish themselves, and their well-cropped "yard" and cozy nook of flowers would prove a source of enjoyment and profit, of which they can form little conception. It has been my privilege to act as censor at a Cottagers' Show of Flowers, Fruit, and Vegetables for some years, and I have been not only pleased but astonished to see the superb collections

which the cottager, who is in earnest, can produce; and, perhaps, some of those days, I may say a few words on Cottagers' Exhibitions.

Professional gardeners may take shame to themselves, that amid the many efforts that have been made by them through the medium of the press, to advance the gardens of the great, the cottage at his gate has been neglected: and why, it may be asked, should not the labourer come within the province and instructions of the gardening periodical? We too often hear contemptible flings from the idler, who floats on the surface of *real* life, at those whose heritage is toil. They sneer at what they term the swarthy hand of labour—forgetting that all that is useful and beautiful has been its offspring, and much of it too at a painful cost to human hearts, much more sensitive of the *real* dignity of manhood than is generally supposed. The working man can well retort the sneer of the idler, by asking who builds and casts down? who hews the block in the quarry and builds the temples of nations? who wings the ocean with white sails, and exchanges the produce of every clime? and by pointing to their achievements in every place where humanity is known. Let us then recognise the working man, and try to foster in his mind a love and interest towards that which has been termed the “purest of earthly pursuits.” But enough! I now beg to tender the following directions for the month:—Look over window plants in pots carefully, and with a soft sponge or piece of cloth and some clean soft milk warm water, wipe the dust from every leaf. Small-leaved plants, such as Myrtles may be more speedily cleansed by dipping their heads in a tub of water, and whisking them several times through the water. The health of plants, to a very great extent, depends on the pores of the leaves being free from dust. What the lungs are to the animal, the leaves are to the plant. Any that are infested with greenfly should be put in a large tub or box and fumigated gently with tobacco smoke two days in succession, giving them about an hour and a-half smoke each time. (Here let me advise you not to use tobacco in any other way.) Keep the surface of the soil in the pot open, and the pots clean. Beware of over-watering Geraniums, and, in fact, all plants at this dull season. One of the very best window plants is the old neglected “Lily of the Nile,” *Calla Æthiopica*. Another first-rate and easily managed thing is the *Dieilytra spectabilis*. Sixpence at the nearest nursery, will procure a root of this most graceful plant. When it has done flowering, it should be placed out in a light rich soil—lifted and potted in September; and when the foliage has decayed, put in any cool place till it begins to grow, when it may be transferred again to the window.

The amateur who possesses a greenhouse, should, towards the end of the month, shift Geraniums that are well rooted, using a rather heavy and rich soil; potting, pinning, and keeping the plants well tied out and near the glass. See that Camellias are never allowed to get dry at the root, else you may lose your buds; and do not expose them at any time to cutting currents of air. Calceolarias that are well rooted in small pots, should now have more pot room. A soil of half loam and well-decayed dung or leaf mould, with a little sand, suits them well. Keep Verbenas, Scarlet Geraniums, and other bedding things free from dead leaves. If you have Vines in your house, and they are not yet pruned, lose no time in getting it done. Little can be done out-doors this month, beyond the collection of manure—road scrapings and turf-parings are first-rate things to mix with your pig's manure; and this, well saturated with soap-suds and other fertilizing liquids (too frequently allowed to find their way into the nearest ditch for the benefit of nettles), will make a famous dressing for your garden in spring. When ground has been previously rough dug or ridged, fork it over on frosty mornings, so that the frost may penetrate and pulverise a greater depth. In light sandy soils, a sowing of Peas and Broad Beans may be got in by the end of the month, if the weather be mild and the ground in working order. Gooseberries, Currants, &c., should be pruned forthwith. Any nailing that may yet be undone should be pushed forward while other matters are not so pressing.

CALENDAR OF OPERATIONS FOR JANUARY.

VEGETABLES.

The observations in this department for December are in most cases applicable for January—a succession of Asparagus, Sea Kale, and Rhubarb should be attended to—a sowing of Early Peas may be put in on a south border as soon as the ground is in a comfortable state, also a few Broad Beans. Plantations of Rhubarb and Jerusalem Artichokes may be planted first opportunity, as there is often too much to do in spring, and the principal crops do not get the attention required, and failure is often the result. The Mushroom house will require great care, particularly in hard weather; too much fire heat is injurious. The potatoes are not keeping well this year. The Ashleaf Kidney, a very useful sort for the first crop, is almost lost with me; the Forty Fold and American are not quite so bad.

FORCING DEPARTMENT.

PINES.—During severe weather, when the application of much fire heat is necessary, pay particular attention to those that are just done blooming and swelling off in various stages, and see that they do not experience a check from becoming over dry at the root. These being kept at the hottest end of the house are more exposed to this evil, which is ruinous to the future development of the fruit. Under the circumstances referred to, it may be quite sufficient to say, that as soon as the ball gives evident signs of dryness, give a watering of weak liquid manure, always making sure that the temperature of the liquid ranges near that of the plunging material. At the same time give a gentle syringing about the axils of the bottom leaves. Maintain a due amount of atmospheric moisture from evaporating troughs, and by syringing the paths and surface of the bed. Give a little air on every favourable occasion, and on extra fine days a gentle sprinkling of tepid water at closing up time will be beneficial, with a temperature of 75° , allowing it to sink to 65° by ten o'clock at night. It is now time to think about starting those that were potted into their fruiting pots early last autumn. Let the roots be carefully examined, and if you find the pots filled with healthy roots, together with the plants altogether in a sturdy condition, you may proceed with the renovation of the bed (where the old system is still adhered to); and in doing so, bear in mind that mischief is more likely to arise from an over-bottom heat than from anything else; of course by the more modern systems of supplying bottom-heat the amount can be regulated at will; but whatever be the means, any increase of bottom-heat which exceeds 90° is dangerous. If the roots be injured, you may bid good-bye to anything worth the name of a proper "start." The atmospheric temperature should also be raised to from 65° to 70° at night, according to the state of the weather, with 10° more with sun heat. It is not an uncommon practice at this time to give a great increase of moisture at the root. While an increased amount is necessary, it is dangerous to exceed that degree which is really demanded, in conjunction with an increase of heat and light, which, if not properly balanced, not unfrequently ends in the production of foliage instead of fruit, especially if the previous growth has not been well matured and rested. Of course, atmospheric moisture must also be increased when bright sunshine occurs, but be careful not to syringe the plants for the present. Let succession plants have as much light as possible, with rather a dry atmosphere.

VINES.—Continue to bestow every attention to late Grapes still uncut, as directed last month. When early started Vines come into bloom, maintain a dry atmosphere and increase the temperature to 70° at night, with an increase of 10° or 15° by day, according as the sun may shine. Give more or less

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air daily as the weather will permit, but avoid anything like a current of frosty air. Shy setting sorts should be impregnated with sorts which make pollen more freely. Thin out all weak and superfluous shoots, and do not crowd the foliage. Wherever there are two bunches on the same shoot, remove the worst at once. Thin the berries as soon as ever they are formed—and thin sufficiently at once—avoiding the handling or in any way touching the berries. Stop all Vines where they are just showing their bunches sufficiently. Where there is nothing else in the house requiring light, stop two eyes above the bunch, otherwise the “close” stopping may be adopted; but it impairs the vigour of the Vine. Do not apply the syringe to Vines in any stage after they have formed their first few leaves, and be careful not to steam pipes or flues when very hot, but keep up a moist atmosphere from troughs and frequent sprinklings of paths and borders. Stir up the fires early in the morning, so as to be able to give air in the early part of the day, and shut up with sun heat early in the afternoon. Start succession houses with a temperature of from 45° to 51° at night, and syringe the rods several times a day with tepid water. Where the Vines are unfortunately planted outside, and where fermenting material has been applied, see that the heat does not decline suddenly and that the “collars” of the Vines are well protected. Pot Vines that have been set a-going early and are swelling their bunches should be encouraged with a brisk temperature, and supplied with liquid manure. It is a good plan to let them root through into a border or boxful of rich mould. Put in a sufficient number of eyes for another season in pure sand, leaving them in a cool house till the beginning of February. Prune all Vines from which the Grapes are cut, and removing all the loose hack, and dressing them over with a mixture of soft soap, sulphur, clay, and lime made of the consistency of thick paint.

PEACH HOUSE.—Still be cautious in the application of much fire heat if the weather be severe and dull. Increase the temperature to 50° ; if the weather be mild and favourable, 5° higher may be aimed at. While in bloom, give air daily, and keep the house rather dry. Syringe trees that are just started and swelling their buds, and prune and dress (with the composition recommended for Vines), and tie later houses. In this department, as in every other, keep everything thoroughly clean and neat.

ORCHARD HOUSE.—Should the weather be severe, continue last month's directions till towards the close of the month. The pots should then be placed on the borders of the house in the positions where they are to stand till they ripen their fruit, and where they will be allowed to root through into the border. Give them a gentle watering at the root, and put everything connected with the house in a neat and orderly state, so as to take off in some measure the present bare appearance of this department. So soon as the buds begin to swell a little, showing distinctly what is going to be bloom, and what not, finally prune those that are the least crowded with wood; but those who have properly carried out the summer and early autumn pruning, will have little to do now.

CUCUMBERS.—See last month's Calendar with regard to those that have been in bearing throughout the winter. Sow some approved variety for planting out next month. Perhaps there is yet no better way of raising healthy strong plants at this season than a judiciously worked bed of dung and oak leaves.

STRAWBERRIES IN POTS.—Put a quantity of these in heat, according to the stock and demand, every fortnight. Keep them near the glass, and begin with a temperature of 45° to 50° at night, increasing it to 55° by the time they begin to truss up. Where they have been started early, and are now in bloom, regulate the temperature from 55° to 60° , and give air freely when mild, avoiding by all means currents of frosty air. In all stages of growth, the Strawberry must be well supplied with fresh air; and a damp stagnant air is certain ruin thus early—when in bloom especially.

FLORISTS' FLOWERS.*

DAHLIAS.—Examine the roots of the finer sorts. Should any be beginning to rot at the crown, cut out the affected part; and when there is any danger of losing the roots, they should be potted and placed in a gentle heat to start the eyes. If a large stock is not wanted, they may be placed in a cool greenhouse till they are required. Trench ground intended for next season's planting, laying it up in ridges.

CALCEOLARIAS.—Fumigate occasionally to keep down greenfly. To keep the plants clean, remove all decayed foliage. Be careful at this season to give no more water than what is required. Look occasionally over store-pots of all sorts of bedding plants; where there is any appearance of mildew in the Verbenas, dust well with sulphur.

PELARGONIUMS.—Where large specimens are wanted, tie out the branches to equal distances, and down as near to the rim of the pot as possible. Keep the house rather dry and warm; give air on all favourable occasions, but avoid cold cutting winds by the side sashes. Water sparingly, and not overhead. In damp dull weather a fire once or twice a-week during the day will be found beneficial, giving air at the same time. Stir the surface of the soil in any that may be getting too close. Fumigate should there be any appearance of green-fly. When it can be conveniently done, fancy varieties will be all the better of a little more fire-heat than the larger growing kinds.

CINERARIAS—Give no more fire-heat than what is necessary to keep out frost. Those plants intended for large specimens should receive their final shift immediately. Let them have plenty of room; tie out the side shoots; turn the pots round occasionally to keep the plants uniform. Give air on all occasions when the weather is favourable. The general stock should be looked over. Shift any that may be getting pot-bound. Keep down green-fly by fumigating, but not too strong; rather let it be done the oftener.

HOLLYHOCKS in frames should be kept rather dry, giving air on all favourable opportunities. Be careful to cover up well during frost; weakly plants or late struck cuttings had better be wintered in a house where they can have the advantage of a little fire-heat in damp or frosty weather. See that none of them suffer from want of pot-room, water, &c. Keep the plants clean by removing all decayed foliage. Trench ground intended for next season's planting to the depth of two feet, adding a good portion of well decomposed manure.

PANSIES IN POTS under glass should have all the air possible in fine weather, by taking off the lights during the day. Seedlings in pans and late struck cuttings should be watered sparingly; take away all decayed foliage; protect from frost, &c.

AURICULAS †—Keep the plants clean; give them plenty of air at all favourable opportunities, and merely as much water as will keep the foliage from shrivelling. Get the topdressing materials in readiness for use next month. One-half old sheep dung and the other half the ordinary compost, intimately mixed and well broken. Keep it under cover till wanted.

CARNATIONS AND PICOTEES.—Give plenty of air when the weather will permit of doing so. Keep the plants free from decaying leaves. When water is given, give it in the morning, and at a time when there is no danger from frost.

PINKS.—Attend to the replacing of the plants in the soil after having been thrown out by frost, and attend to former instructions respecting protecting them from being broken over by heavy winds.

TULIPS.—Keep off heavy rains from the fine beds.

* By Mr J. Downie, of Downie & Laird.

† By Mr J. Lightbody, Falkirk.

NOTICES TO CORRESPONDENTS.

A DAHLIA FANCIER.—Royal Scarlet will be let out by Mr Keyne of Salisbury, in May, at 10s 6d. It is a flower of first-rate quality, and will be much sought after in the coming season.

Lady Popham will be let out by Mr Turner of Slough; this is also a beautiful flower in its class—white tipped with rosy lilac.

P. R.—*Pinus insignis*.—You cannot plant a better tree for park or forest scenery. It is densely covered with foliage of the deepest green, and attains the height of a 100 feet in its native country.

J. T., PERTSHIRE.—There is not such a thing as a Yellow Moss Rose; you have lost your money—the two guineas will help Monsieur on his way to the next simpleton.

J. PATTERSON.—To keep down mildew, dust well with sulphur. Pansies in pots are more liable to be attacked than those in the open border; keep your plants clear of decayed foliage.

R. ORR.—For a list of American Nurserymen, consult *Edward's Almanack*.

PROCEEDINGS OF THE BOTANICAL SOCIETY FOR
NOVEMBER, 1856.

(Continued from page 392, Vol. V.)

3. *On the Stellate Hairs of Aralia papyrifera*. By Professor BALFOUR.

Stellate or star-like hairs have been observed in many plants. In Cruciferous plants there is a tendency in the hairs to fork, and they often divide into rays at the top. This is well seen in *Alyssum*. In *Deutzia scabra* the stellate hairs on the leaves have been long known as beautiful microscopical objects. In *Rottlera tinctoria*, and in the air cavities of *Nuphar luteum* stellate hairs have been detected. The scales which occur on the epidermis of plants often exhibit a stellate form. Such scales occur on *Elæagnus* and *Hippophae*, as well as in *Platycerium alicorne* and *Polypodium sepultum*. When in the Botanic Garden at Oxford in August last, Mr Masters, the able assistant in the Herbarium department, pointed out to me a fine plant of *Aralia papyrifera* in the Conservatory and mentioned that the brown scaly substance on the petiole, as well as the hairs on the leaves, &c., exhibited a beautiful stellate appearance. As the fact seems to be new, I have brought it under the notice of the Society. Specimens was shown under the microscope, and a leaf of the plant from the Edinburgh Botanic Garden was exhibited.

4. *Notice of the Results of three days botanizing in the neighbourhood of Tortworth Court, Gloucestershire*. By Professor BALFOUR.

In August last, immediately after the meeting of the British Association at Cheltenham, a party consisting of the Hon. Mr Waldegrave, Professor Rogers, Professor Gregory, Rev. Robert Rainy, and myself, visited Tortworth Court, in Gloucestershire, on the invitation of the Earl of Ducie. During our residence there, we had an opportunity of examining the Geology and Botany of the district. The country in the immediate vicinity of Tortworth is interesting in a geological point of view, inasmuch as it furnishes more or less completely examples of various formations, from the Silurian to the Oolite. Under the guidance of Lord Ducie, who is well acquainted with the rocks and fossils of the District, we were enabled to trace the alternations of the strata. The variety in the geology of the district is associated with changes in the Flora. Even a superficial glance showed marked differences in the vegetation of different localities, and I have no doubt that a more careful examination would have pointed out relations between the plants and the rocks on which they grew. The Flora of the Oolitic rocks was distinct from that of the carboniferous series,—or at all events, there were certain characteristic plants of the one series, which were not met with in the other.

The subject, however, of the relation existing between plants and the soil in

which they grow, is one which is still involved in much obscurity. There are no doubt certain marked differences recognisable by all. Thus the aquatic and the marsh plants of a country are distinct from those of the pastures and forests; those of moist saline soils do not agree with those of ordinary soils. Although we thus see certain evident divisions in the relations between plant and soil, we have by no means been able to determine with accuracy the connection which subsists between a magnesian, siliceous, and calcareous soil and the plant which it produces.

When we speak of geological formation, the difficulties are increased; for, as De Candolle remarks in his able work on Botanical Geography, each geological formation evidently contains very different mineralogical matters, and the same substances are found in several formations. Thus in order to ascertain the effect of calcareous, siliceous, and magnesian materials, we must not look at the formations figured by geologists in their charts, but we must examine the mineral nature of each locality and observe its influence. There are few formations, the mineralogical constitution of which is constant. Moreover, it often happens that the superficial soil in which plants grow has little in common with the rocks below it. These considerations ought to make us cautious in drawing conclusions regarding the connection between the Flora and the geological character of a district.

The following remarks are the result of a day's excursion to the Cotswold Hills, and of two days botanizing in the immediate vicinity of Tortworth:—

On 18th August, I visited, in company with Professor Rogers and Lord Ducie, Stinchcomb Hill, in the Cotswold range, distant about six miles from Tortworth. The hill belongs to the lower Oolite series. On the way to it we passed over the Caradoc limestone, the New Red, the Lias, and the Oolite. The hill presents to the eye of one accustomed to the Scotch hills remarkable features. There was a want of fine green dense turf, and the sides of the hill, which were very steep, presented a completely bare and bleak aspect. The vegetation consisted chiefly of *Carduus acaulis*, *Carlina vulgaris*, and *Poterium Sanguisorba*. Along with these were also mixed the following species:—*Scabiosa Columbaria*, *Thrinchia hirsuta*, *Apargia autumnalis*, *Briza media*, and a few specimens of *Campanula rotundifolia* and *Gentiana Amarella*. On the summit of the hill, where the turf was more dense, there appeared to be evidences of a Roman outpost, and in this situation *Urtica dioica* occurs, a plant which usually follows man's footsteps, and the seeds of which have probably been conveyed to this place by parties visiting the summit. From this point there is a very extensive view of the vale of the Severn, the Malvern hills appearing in the distance.

Among the plants which were noticed in the lower grounds, between Tortworth and Stinchcomb, may be noticed the following:—*Sinapis nigra*, *Trifolium fragiferum*, *Ulex nanus*, *Rubus discolor*, *Pastinaca sativa*, *Sison Amomum*, *Galium Molugo*, *Lactuca muralis*, *Carduus nutans*, *Inula Conyza*, *Atropa Balladonna*, *Lithospermum officinale*, *Lycopus europæus*, *Stachys Betonica*, *Quercus sessiliflora*, and *Tanais communis*.

In quarries at different places, characteristic Oolitic fossils were gathered.*

August 19th and 20th were occupied in the examination of the country in the immediate neighbourhood of Tortworth Court. The ground is very various. Hill and dale, wood, lake, and marsh, pasture land and streams, diversify the scene. Some interesting species of plants occur in the wooded and marshy grounds close to the castle, and among the ruins of an old vineyard, the terraces of which rise on the side of a hill.

The Flora of the mountain limestone district chiefly engaged attention on the 19th. Among the plants gathered the following may be recorded as of interest:—*Clematis Vitalba*, *Helleborus foetida*, *Viola hirta*, *Epilobium angustifolium*, *Hippuris vulgaris*, *Dipsacus pilosus* in great profusion, *Inula Conyza*, *Viburnum Lantana*, *Ligustrum vulgare*, *Senecio tenuifolius*, *Solanum Dulcamara*, *Verbascum Thapsus*, *Chlora perfoliata*, *Echium vulgare*, *Linaria Cymbalaria* and *L. minor*, *Sorophularia aquatica*, *Calamintha officinalis*, *Verbena officinalis*, *Lysimachia vulgaris*, *Rumex Hydrolapathum* abundant and very large, *Euphorbia amygdaloides*, *Tamus-camianis*, *Neotia Nidus-Avis*, *Typha latifolia*, *Arum maculatum*, *Equisetum Telmateju*, *Carex remota*, *C. riparia*, *C. pendula*, *C. pseudo-Cyperus*, and *C. vulpina*; the latter is one of the plants which occurs usually on the sea shore in this neighbourhood and in Scotland generally. This is also the case with *Samolus Valerandi*, a plant found in the marshy ground near Tortworth. Such plants as these showed that even plants which grow in some parts of the country in saline soils, occur in marshy ground inland.

On the 20th August, I examined the flora, both of the mountain, limestone, and of the carboniferous series. Among the plants seen I may enumerate *Coronopus Ruellii*, *Nasturtium palustre*, *Chelidonium majus*, *Malva rotundifolia*, *Geranium pratense*, *Vicia Cracca*, *Saxifraga tridactylites*, *Enanthe fistulosa*, *Veronica Anagallis*, *Plantago media*, as occurring on the carboniferous strata. Besides these I also gathered *Malva moschata*, *Geranium lucidum*, *Sempervivum tectorum*, *Cotyledon Umbilicus*, *Sedum anglicum*, album, and rupestre, *Monotropa Hipopitys* in great abundance, *Orobancha minor* (?), *Salvia pratensis*, *Scutellaria galericulata*, *Ophrys apifera*, *Ceterach officinarum*, which was common on o'd walls everywhere.

Coal has been worked in part of the district near the remains of an old Roman villa, many of the stones of which are very perfect.

In the grounds at Tortworth, many valuable conifers are cultivated. I observed *Wellingtonia gigantea* 2½ feet high, *Araucaria imbricata*, and *Pinus insignis*, both very strong; *Picea nobilis*, *Pinus excelsa*, *P. Strobus*, one of the trees being about 80 years old, and being 10 feet in circumference a yard from its base, the bole rising to the height of 40 feet without giving off a branch; *Abies Douglasii*, *Abies Morinda*, not succeeding well; *Pinus Pinsapo*, *P. Nordmanniana*, *Abies canadensis*, *Cephalotaxus Fortunei*, *Taxodium sempervirens* and *T. distichum*, *Cryptomeria japonica*.

SUMMARY OF THE PLANTS COLLECTED.

PHANEROGAMOUS PLANTS.—Dicotyledones, Thalamifloræ				59
...	Calycifloræ	...	...
...	Polypetalæ	...	...	73
...	Gamopetalæ	...	...	56
...	Corollifloræ	..	...	68
...	Monochlamydeæ	...	...	41
				297
Monocotyledones, Dictyogonæ				1
...	Petaloidæ	..	...	26
...	Glumiferæ	...	...	30
				57
				354
Acotyledines, Equisetacæ and Filices				16
Total,				370

5. *Notice of the stoppage of a water pipe by the roots of a tree.* By JOHN DUNCAN, Esq. Communicated by Professor BALFOUR.

Mr Duncan of Burnhead, sent to the Museum at the garden, specimens of roots which had covered the bottom of a well, and had entered into the leaden pipe leading to it.

In a field at Burnhead there is a large reservoir, and from this, water is conveyed in a leaden pipe for some distance to a well, the water of which is drawn up by a pump. In the course of last autumn no water could be drawn from the well, and on examination the bottom of it was found to be dry, and filled with an enormous matting of roots. These roots had also penetrated into the leaden pipe, and filled it up completely so as to prevent the water from flowing. On cutting through the pipe and pulling out the roots which were very firmly impacted, the water flowed in abundance. The roots were traced by Mr Duncan to a Sycamore tree (*Acer Pseudo-platanus*) growing near the well.

6. *On a method of preserving plants in their natural form, and with the colour of the flowers.* By MESSRS REVEIL AND BERJOT. Communicated by Professor BALFOUR.

Many attempts have been made to preserve plants in such a way as to retain their form, their usual habit, and their colour. In 1770, M. Quer, a Spaniard, presented to the Academy of Bologna a collection of plants carefully and beautifully dried in their natural form. In accomplishing this he detached the leaves and dried them repeatedly, between sheets of paper in the sun, or in an oven moderately heated. The flowers preserved their colour and form, when dried rapidly and very slightly pressed. The leaves and branches were afterwards fastened to the axis by means of gum. The process was a tedious one, and there was great difficulty in

placing the the leaves and branches in their natural position. M. Monty has explained the process in his "Observations sur la Physique, et sur l'Histoire Naturelle," 1772, p. 623; and he states that the temperature of the human body is the best for the purpose of desiccation.

In 1772, M. Monty endeavoured to preserve plants, by covering them with various substances such as millet, rice, wheat, &c. Ultimately, he found that white and grey sand was best suited for the purpose. He first passed the sand through a sieve, to separate the coarser particles, and he then levigated it so as to remove the finer particles. The sand was then in the dried state used to form as it were, a mould of the plants which were put into boxes, and exposed to the sun or to the heat of a baker's oven. M. Stanislas Martin subsequently adopted a similar process, which he called the embalming of plants.

MM. Reveil and Berjot have followed M. Monty in using sand, for the purpose of preserving plants, and the following are the details of their process:—

White sand, the grain being of nearly equal size, is selected. It is passed through a hair sieve, is thoroughly soaked with water, so as to remove the very fine particles, and the washing is continued until the water comes through perfectly clean. The sand is then dried in the sun, or in a stove, being constantly stirred. For every 25 kilogrammes (50½ lbs.) of sand there is then added a mixture of 20 grammes (308 grains) of stearic acid, and 20 grammes of spermaceti. The whole is well mixed together, with the hands, so that every particle of sand may come in contact with the greasy matter.

A layer of sand is now put in a box, the length and breadth of which varies, but the depth is about 12 centimetres. The bottom of the box (4½—5 inches) slides, and can be removed easily. On the bottom there is a grating of iron wire, with large meshes.

The layer of sand having been deposited, the plants are placed in it; care being taken to spread out the leaves and to mould or model the Corollas in the sand which is cautiously poured in. The plants are then covered with sand completely. It is better to keep the plant in a single layer. Care should be taken to put the smallest possible quantity of sand on the leaves and branches. The box is then covered with a sheet of paper, and is placed in a stove or oven heated to about 40° or 45° C., (104° to 115° F.). Desiccation takes place very rapidly; when it is considered to be complete, the bottom of the box is removed; the sand passes through the iron trellis, and the plants remain above.

The greased sand adheres very little to the plants, and it is always easy to remove it. It is often sufficient to tap them gently, in order to make all the particles fall off; provided always that the plants have not been gathered wet. It is thought best to collect the plants before the flowers are completely opened, and to attain this, another to be finished by plunging the plant in a small quantity of water. The desiccation of fleshy plants is expedited by being put in a vacuum.

Sand, whether greased or not, cannot be used in drying plants with a viscous external secretion, such as *Hyoscyamus*. In such cases grains of Millet or Rice may be used. By this process, it is seen the brilliancy of the plants is perfectly preserved. Yellow and other flowers retain their colours well; violet and red less completely.

The dried plant when in contact with the air may become moist. This is avoided by putting it in a closed glass jar, at the bottom of which is placed some quicklime enclosed in silk paper, and covered with moss.

This method of preserving plants is recommended for schools of Pharmacy.

Dr Balfour stated that Mr Marshall, a pupil of his, had, many years ago, made some beautiful preparations of plants by immersing them in fine Boxwood sawdust. He found that this answered better than sand, which he also tried. After all, the plan is one which can only be adopted on a very small scale, and even the best specimens prepared by this method are very fragile and unsatisfactory.

7. *On Crillitiche hamulata* of Kutzing, found near Jardine Hall. By F. TOWNSEND, Esq. Communicated by Sir WM. JARDINE.

The plant was gathered in a ditch communicating with the River Annan, close to Jardine Hall. Mr Babington has decided that it is the plant described in his Manual as *C. pedunculata*, var. *sessilis*. The important character in *C. hamulata* is the falciform bracts. These fall off early, and were not noticed by Mr B. in ordinary wild specimens. He has, however, of late observed them in cultivated specimens of his *C. pedunculata*, var. *sessilis*. Mr B. considers *C. hamulata* as the type of the species, and *C. pedunculata* to be a variety.

8. *On Garden Plants found in Waste Ground near Falmouth, in a Letter from Mr W. P. COCKS to Professor BALFOUR.*

Mr C. remarked:—"We have a few experienced and practical field botanists in Falmouth—keen-sighted, patient in investigating, and persevering in exploring. They have a thorough knowledge of every spot of ground for miles around the town, but they have not been able to procure the long wished-for *Hypericum anglicum*. I do not deny that it has been found; but its whereabouts in Falmouth is an enigma not easily solved. I have sent you a list of a few of the "garden stragglers" to be found during the season growing in our hedges, corn and hay fields, and waste grounds. We are indebted to the "garden pit refuse" for the cultivated portion of our Flora. Nearly every house in this place has a large open pit, into which the occupants throw the refuse of the house garden, along with material for manure. This heterogeneous mass is secured by the farmer three or four times during the year, and deposited on waste ground in the neighbourhood of his fields, and allowed to remain until wanted. To this we are indebted in a great measure for the appearance of the following plants in different localities near Falmouth:—

- Cucumis sativus*—waste ground, Simon's Lane.
- Lagenaria vulgaris*—Drening heap, Bullmore's corn field.
- Ribes Grossularia*—Waste ground, Simon's Lane.
- Althæa rose* and varieties—Simon's Lane, Tehyde Lane, &c.
- Lunaria rediviva*—Waste ground, Boyrn's cellars.
- Aster serotinus*—Waste ground near Tehyde Terrace.
- Symphytum officinalis* and var. *patens*—Waste ground not uncommon.
- Barago officinalis*—Waste ground, Tehyde Terrace Lane.
- Nicotiana rustica*—Neglected garden ground.
- Verbascum Thapsus*, var. *Thapso-nigrum*—Oat field.
- Vinca major* and *minor*.—Hedge, Penryn Road.
- Narcissus poeticus*—Hedge, neglected garden ground.
- Oenothera biennis*—Neglected garden ground.
- Silene armeria*—Corn field.
- Oxalis stricta*—Waste ground.
- Rubus idæus*—Waste ground.
- Fragaria moschata*—Waste ground.
- Papaver somniferum*—Hay fields, &c.
- ... *orientale*—Hedge, hay field.
- Pæonia corallina*—Waste ground.
- ... *officinalis*—Do.
- Aconitum Napellus*—Do.
- Linaria Italica*—From garden refuse.
- Antirrhinum majus*—Waste ground.
- Armoracia rusticana*—Waste ground and fields.
- Cheiranthus Cheiri*—Escaped from gardens.
- Lavatera arborea*—Neglected garden ground.
- Hypericum calycinum*—Do.
- ... *hircinum*—Do.
- ... *anglicum*—(Bishop Hopkins says, no labour should be thought too great for the searcher after truth.)
- Helianthus annuus*—Fields, &c.
- Symphoria leucocarpa*—Hedges.
- Dianthus caryophyllus*—Neglected garden ground, &c.

Dr Balfour laid on the table a notice of Mr Munby's *Plantæ Algerense*, which are being published in Fosciculi; also a notice of Mr Sowerby's *English Botany*, which is now being sold at a reduced price.

Dr Balfour exhibited 100 microscopical slices of woods prepared by Nordlinger. also a specimen of *Centaurea nigreseens* from Professor Henslow, which was shown to be a mere form of *nigra*.

Dr Balfour also exhibited a specimen of white coal from Australia, and read the following letter from Professor Harkness:—

"I have enclosed you a bit of a substance called "White Coal." It comes from Australia, and is found on the coast of Port-Jackson. The age of it seems to be tertiary and it consists of a large quantity of silicia, in which there occur numerous sporangia of a species of *Polypodium*, the brown resinous looking bodies being of this nature. It has a simulation to the spores of *Lepidodendron*, and shows that even in recent periods sporangia may make up combustible matter."

THE SCOTTISH GARDENER.

THE BEAUTY OF NATURE IN RELATION TO LAND- SCAPE GARDENING.

No. 1.

WE propose to lay before our readers some studies on the Beautiful in the external world, as affording hints for improvement in the laying out of gardens, and the construction of park scenery. We deem it expedient to premise a few remarks on the subject of the Beautiful generally considered; not for the purpose of elaborating another theory of Beauty, for it must be owned that we have had more than enough of these already; but rather in the way of preservatives against the mistakes and the confusion into which, in the more practical part of the subject, we should otherwise be prone to fall. Ever since the question "What is Beauty?" was broached by Plato more than 2000 years ago, philosophy and literature have teemed with speculations on this subject, and with little gain in proportion to the expenditure of thought. Some have supposed its essential principle to lie in utility, some in fitness, some in variety combined with unity, some in association, and others in numerous other things; and they have generally been very self-satisfied, and each has appeared to himself to have said the very last word that remained to be said on the subject. The theory which resolves beauty into association, advanced by Mr Alison in his finely written essays on Taste, and simplified and expounded with singular ingenuity by Lord Jeffrey, in his celebrated article on Beauty in the "Encyclopedia Britannica," has for many years been received with great favour wherever the English language is spoken. It has long been an accredited article of faith in the *Æsthetics* of Edinburgh; but it has never been a favourite with artists, or with those concerned in the creation or improvement of the Beautiful; and no wonder, for it removed Beauty, in great measure, out of their sphere of action, into that of mental and emotional training. Its day seems fast passing away, and as yet none of the more recent speculations have made good their right to the place which is becoming vacant. In these

circumstances we may well excuse ourselves from attempting a theory; we shall therefore merely state a few ascertained principles, and these such as have an evident connection with the subject which we have specially in view.

In any investigations concerning the nature of the Beautiful, there are three things which are to be carefully discriminated. There is, first, the emotion awakened by the Beautiful, the pleasurable feeling which makes "a thing of beauty a joy for ever." There are, secondly, the mental cognitions, the sensations, perceptions or other intellectual states, which connect the emotions with external objects. And, thirdly, there are the qualities or characters of outward things, which are the objects of the mental cognitions, and the causes or occasions of the pleasurable emotions. It is under the third head that the field of the landscape gardener is to be found; but he cannot safely overlook the other two, for the emotion is obviously the test of beauty, seeing that a thing is beautiful in proportion, as it awakens the feeling of beauty; and the intermediate or intellectual sphere, the cognitions as we have called them, often afford some insight into the *rationalia* of his judgments in his interesting art. We propose to give a paper on each of the first and second points, and then to address ourselves with some detail to the matters under the third head, as that which specially belongs to our design. Meanwhile, we beg our readers to master the three points above explained as the ground-lines of all correct thinking on the subject.

The emotion of Beauty, in its simpler states, seems to be an ultimate principle of human nature. Certain colours, forms, and sounds have such a relation to the human organism, that they invariably afford pleasure to the unsophisticated mind. The simple perception of natural forms is a delight. The sensations produced by some colours and sounds are always pleasing. It is literally true, that, unless the attention is withdrawn by some over-mastering passion, or is deadened by some engrossing habitude, the eye is never satisfied with seeing nor the ear with hearing. And the originality of these emotions is proved by the phenomena of childhood; infants, as soon as they notice aught, invariably delight in bright light, and vivid colours; and this infantine delight continues to the end of life. There is no human eye which does not rest gladly on the verdure of the fields, and the gorgeous tints of the summer flowers; there is hardly a heart which "never felt the witchery of the soft blue sky." Perhaps no tint is more attractive to children than scarlet, and it is well known that the most experienced florists are devoted to the same hue, a scarlet Verbena, or Rose, or Dahlia, being the supreme object of their ambition; nay, in their catalogues they often denominate that scarlet, which only approaches it in the form of crimson or orange. For this some would scorn them as childish; for our part, we rejoice to see the natural prevailing over their too common conventionalities. These natural and primary delights in colour, form, and sound are the source of our first emotions of Beauty, and we be-

lieve they are hardly ever separated from them, so far, at least, as these emotions are connected with the external world.

This conclusion is, of course, opposed by those theorists who discover in association the origin of our ideas of beauty. Mr Alison, for example, being unable to deny the pleasure which is experienced from colour, designates it "a pleasure of sensation," and he contrasts it with what he calls "emotions of taste." It is sufficient to reply that a pleasure is an emotion, and that the colour which excites it—the blue of the sky for instance—is called beautiful, in ordinary language, which, as F. Schlegel truly says, is the picture of the human consciousness. It is very arbitrary to ignore this usage of language on the point before us, and to invoke its authority when it is needful to distinguish between the beautiful and the agreeable, as these theorists invariably do. Lord Jeffrey, in his version of Alison's theory, does not deny the name of beautiful to the emotions arising from colour, form, and sound, but he affirms that they are derivative, and not original. "The Beauty," he says, "which we impute to outward objects is nothing more than the reflections of our own inward emotions, and is made up entirely of certain little portions of love, pity, and affection, which we have connected with these objects, and which still, as it were, adhere to them, and move us anew whenever they are presented to our observation." It is singular that we can never reach these bits of love, pity, &c., by the analysis of the self-consciousness. One poet speaks of "the green-eyed monster jealousy," and another of "the purple light of love;" but these are only fanciful analogies, for by all our deepest searching into "the dark backward and abysm of time," we cannot find that we have overlaid a green cabbage, for example, with jealousy, or a red cabbage with love. Ladies, indeed, are said to be prone to lay out their love on red coats, just as, on the contrary, turkeys, both male and female, are known to hold all red garments in special detestation; but surely there must be something in the red itself, for the same consequences do not appear to follow the more neutral tints of drab and brown. If there is nothing intrinsically attractive or repulsive in the brilliant colour alluded to, it is altogether unaccountable that so many human beings should entwine their love with it, and that so many birds should find in it fuel of exasperation. We may admit that the consciousness cannot reach back to the origin of our emotions of the beautiful; and yet we may maintain that the facts themselves are transparent to observation. Thousands have seen a babe grasping at a golden trinket, or topaz brooch, on his mother's breast, the first time his attention was drawn to their sparkling sheen. What little portions of love, pity, or affection, is he then possessed of to suspend on these jewels? Or if he has arrived at these sentiments, why does he not attach them to the graver parts of the dress? The first time a child notices light he obviously feels it a pleasant thing to behold the sun. Till then, all the pleasurable emotions he has experienced have flowed from the sweetness of his mother's milk, the softness of his mother's bosom,

the warmth and gentle pressure of his light clothing, and the stirrings of young life within him. These feelings belong to the category of the agreeable, and to compound the beautiful out of these would be to employ brick to build a palace of marble. In that "dewy dawn of memory," love, pity, and affection are only looming in the future. But, on the other hand, the child has his pains, his restless uneasiness, and his impatient desires for change—feelings which he expresses by those shrill cries which marked his advent into this world—and he is stilled as quickly as possible by the chant of the nurse, or softly breathed swell of the cradle hymn. Surely if inward emotions are so invariably reflected by outward things, all human beings ought to hate sweet sounds, and music especially. But in this part of our nature, the facts patent to observation are as contrary to the theory of association as it is possible to conceive.

It is true that it would be as unphilosophical to deny to association all influence on our emotions of Beauty, as it is to ascribe the origin of these emotions to its exclusive operation. A negro would mostly prefer a black Venus to a white one. There are many Europeans who would rather chew tobacco than sugar-candy. There are numberless other deviations from common and natural tastes. Such are the effects of habit on likings and dislikes—that is, in the sphere of the agreeable. That most of the original emotions, arising from colour, remain unaltered, is proved by the fact, that the negro would choose rather to adorn his woolly locks with a kerchief of bright scarlet than with one of the hue of his sooty spouse. The black races are noted for their love of brilliant colours. It is admitted that many of our emotions are partially affected by the principle of association; but they are reached chiefly, if not exclusively, through the medium of those mental trains, the consideration of which belongs to another part of our subject. Meanwhile, let us hold that the primary sources of our emotions and ideas of the Beautiful exist in the adaptations of our organic nature, to the external world.

We have been the more desirous to maintain the originality of our emotions of Beauty, and their correspondence to actual things in the world without us, because if they could be made out to be exclusively derivative—the results of habits and associations—the occupation of the landscape artist would be in great measure gone. It is also of importance to attend to this part of the subject, because emotion is the test of beauty, and the range of the emotion assigns limits to the quality of the beauty conceived as outwardly existing. In what departments of nature, then, is Beauty to be found? A late venerable Professor used to teach that it attached itself to the objects of the Ear, the Eye, and the Mental Eye—meaning, not that all these objects are beautiful, but that beauty occurs among them exclusively. This remark suggests another important enquiry—viz., how is the Beautiful to be differenced from the agreeable, as it is always distinguished in the language of cultivated nations? Not by the nature of the respective emotions, simply considered, for in

this respect they are both defined by their giving pleasure ; but by something in the manner in which the emotions are connected with the outward objects. This we shall endeavour to explain by an analogy borrowed from the theory of the secondary properties of matter ; and here we must solicit patience of the reader, for we lie under the disadvantage of being obliged first to explain our explanation.

Suppose us then to be investigating the nature of our perceptions of colour, and that we have a Lilac tree in full bloom before us. At first sight, the various hues seem to be inherent in the plant itself—the green in the leaf, and the purple in the flower. We soon discover that light is essential to these appearances, for where there is no light there is no colour. Next, the laws of optics teach us that by white objects all the rays of light are reflected, that by black they are all absorbed, that by other coloured objects they are partly reflected and partly absorbed, and that the diversified reflections and absorptions depend, it is supposed, on the peculiar surface of the reflecting body, which peculiarity, as being uncognisable by our senses, is regarded as an unknown or occult quality. The Lilac leaf reflects the green rays, and the flower the purple ones ; and these reflected rays impinging on the visual organ, produce the sensation of green or purple on the mind. Now here we have got three things—the unknown property of the reflecting surface, the reflected light, and the mental sensation. To which of these are we to appropriate the name of colour ? The philosophers, who have agreed about the analysis of the phenomena, have differed about the name. Dr Reid assigned it to the reflecting surface ; Dr Thomas Brown to the sensation ; and Sir William Hamilton doubts whether either the one or the other abstraction is generally made in practice. If we must choose one of the three, we would say that the name of colour belongs to the sensation, and, therefore, speaking correctly, colour exists in the mind. But whatever we call the sensation—and this is the analogy of which we desire to avail ourselves—the sensation is invariably thrown outwards, and seems spread over the object of vision, and is never thought of as inward except when we are employed in analysing our consciousness.

So is it with Beauty. Our pleasing emotions, called forth by certain objects, are projected on these objects, and then we call the objects beautiful. In external nature the emotions in question are awakened by material things which in one way or other affect the eye and the ear ; and always involve the ideas of outwardness and distance. On the other hand, agreeable sensations, strictly so called, seem to cling to the bodily organ. The fragrance enjoyed may come from a Rose, but it is apparently in contact with the nostrils. The savour is on the tongue or palate, and the smoothness of a body is at the tips of the fingers. From habit we conceive projected sensation or emotion to be less sensuous than that which remains contactual ; and hence the Beautiful appears to be more ethereal than

the Agreeable. Language, the picture of consciousness, has seized this distinction very accurately. Did our purpose lead us to analyse mental beauty, we should find the same principle uniformly preserved.

It is important to observe, that whatever unity there is in the Beautiful exists in the emotions. There are innumerable visible objects called beautiful, and the only common quality that runs through them all is that they afford pleasure. So is it with sounds. The emotions themselves can hardly be said to possess strict unity, for they vary from faint pleasure up to ecstatic delight, and, in cases of sublimity, to absorbing awe.

It is the emotional side of Beauty that makes this "a bright and breathing world." In individuals, the strength of emotion may differ, as much as the poetical and the prosaic mind. Even in the sphere of sensation, this is probably a much brighter world to some than to others; in the same proportion, in extreme cases, as the eye of a painter excels the organ of one afflicted with colour blindness. Age too is productive of diversities. To a youth endowed with quick and unsated sensibilities, Nature seems

"Apparelled in celestial light,
The glory and the freshness of a dream."

Referring to a somewhat later stage of life, the same poet says—

"The sounding cataract
Haunted me like a passion: the tall rock,
The mountain, and the deep and gloomy wood,
Their colours and their forms were then to me
An appetite; a feeling and a love,
That had no need of a remoter charm,
By thought supplied or any interest,
Unborrowed from the eye.—That time is past."

WORDSWORTH, *TINTERN ABBEY*—Works, Vol. ii p. 182.

Yes, the time of simple ecstasy passes away, and graver thoughts and associations are interwoven with the emotions of the beautiful. Man is essentially a being of progress. In youth his emotional nature is like a tetrachord, a harp with four strings; in age it may have well-nigh a thousand; and if the separate tones are less dulcet than at first, yet the full harmony, "the still sad music of humanity," may be more exquisite than ever.

J.

HINTS TO AMATEURS ON ERECTING AND HEATING HORTICULTURAL BUILDINGS.

BY MR THOMSON, DALKEITH GARDENS, DALKEITH.

IN redeeming the promise made in last month's "Scottish Gardener" under the above heading, I now proceed to point out the various purposes for which the range of glass therein described, may be made available for the pleasure and profit of the amateur gardener.

Let me remark before proceeding further, that where, under special circumstances, it may become desirable to erect a house of a less substantial character, one of the same size can be erected at a much smaller cost than the one I have described—wood may take the place of iron in the path—a fire-clay pipe flue instead of hot-water. A less perfect system of ventilation may be adopted at reduced cost. American timber and 13 oz. glass will also tend to reduce the figure; at the same time, where the party erecting the house has a permanent interest in the ground it is built on, I would strongly urge the propriety of having the whole material of the most substantial description.

The building being complete, I will now throw out a few hints as to the easiest method of getting it stocked with a Vine up each rafter; and from the great width of the sashes, a Vine may be cultivated on the "close pruning system" under each rafter, so as to yield excellent crops of Grapes without in any way interfering with a variety of other purposes for which the house may be used. If the soil over which it is built is what may be termed "good garden soil," neither too stiff and clayey on the one hand, nor too light and gravelly on the other, I do not advise the amateur to go to the expense of removing it, and getting maiden loam with all the catalogue of "unclean things" sometimes recommended for Vine borders, and that raise great expectations never to be realised. Let the soil under glass, and a strip of from 6 to 10 feet wide along the front of the house be trenched 2 feet deep, and to this add eight cart load of old hotbed manure, or leaf-mould, six cart load of old plaster or lime rubbish, four cwt. of crushed bones, and four cwt. of rape dust; let the whole be turned over more than once, and if possible, during dry frosty weather. This done, let the whole be levelled, and immediately inside the hot water pipes, throw out a trench four feet wide and one foot deep; fill up said trench to within three inches of the general surface level, with a compost of two parts of light maiden loam, one part of leaf-mould or well decomposed horse dung, such as an old Mushroom bed, and the remaining part of lime rubbish and brick dust, adding a cwt. of crushed bones, and one of rape dust. On this plant the Vines, and in doing so, shake all the soil from their roots, and spread them out at equal distances, keeping the stem 6 inches inside the pipes, tying the end of it to the wire at once. This done, fill up to the general level with same compost, and give water through a rose—there being 15 rafters, the same number of Vines will be required, and I would recommend the following selection, some for their intrinsic excellence, others because they are hardy and hang till late in the season, and I would plant them in the order they are named, beginning at the farthest end of the house from the door,—1 Lady Down's Seedling, 1 Black Barbarossa, 1 West's St Peters, 1 Black Prince, 1 Royal Muscadine, 1 Sweet-water, 1 Bushby's Golden Hamburg, and 8 Black Hamburgs.

These should be good, sound, well ripened Vines from last year's eyes, and procured from some nurseryman who takes the precaution to shelter them during winter, else they may be all but frozen to death, though this can only be discovered when they ought to begin to grow vigorously, instead of, as I have often seen, making miserable wood like straws, when they had received previous injury from frost; and not unfrequently they never start at all. During the first season keep as high a temperature as the other plants in the house will admit of; moisten the soil frequently, and on no account pinch or stop a single shoot; let all grow this year that will. You want strong roots this year, that you may have fine strong canes next. Some have recommended the stopping of the top shoots to strengthen the roots, but both theory and practice contradict this flatly, and it should be avoided.

The Vines planted, the house may be with ease and at the cost of some six shillings, divided into three compartments by means of oiled calico partitions, with curtain doors—the extreme end compartment, where the hardest Grapes are planted, to be used as an orchard house, the centre as a greenhouse, and that next the door as an intermediate house, that is, midway betwixt a stove and greenhouse, for bringing forward lots of seeds and plants that will at once suggest themselves in spring. This division may be so managed as to yield Grapes ripe in July, while the other two divisions will afford a supply till February. The difference of temperature in these divisions to be regulated by the quantity of air given to each.

To those amateurs who are fond of fine poultry, let me say that the finest spring chickens I ever saw were reared in a compartment of a house like that in question; they had access through the wall from where they roosted; they lay basking in the March sun, feeling none of the evil effects of March winds, and were a month more forward than those reared in the ordinary way, and by the time they would have been troublesome in such a place, the state of the weather allowed their exclusion. These are a few of the purposes to which such a structure may be devoted; many others will suggest themselves to those of your readers who are interested in such matters.

POT VINES.

By way of fulfilling the promise made at the close of my remarks on pot Vines last month, I beg to hand you a few brief directions for the growth of Grapes on this system.

If a quantity of strong, well ripened eyes were not set agoing as advised last month, it is not yet too late; but if started a month ago, all the better—they will be "calloused," and have pushed an inch or so early this month. The method I adopt is to put in double the quantity of eyes required thus early, in pans three or four inches deep, putting a thin layer of silver sand under them, and

covering them slightly with the same, and in this way they are allowed to remain in a temperature of from 50° to 55° till the first week in February, when they should be placed in a gentle bottom heat near the glass, with a night temperature of from 60° to 65° , and in this way it will be found that they come away much stronger than when put into over much heat immediately they are inserted.

As soon as they make roots an inch or so in length, pot them off singly into large 60 s. pots, choosing a few more than the required number of the strongest plants. When potted, return them to the same position, but beware of over-much bottom heat, or perhaps you will burn their young and tender white roots. Immediately they have tolerably well filled their pots with roots, shift into 32 s., rejecting any that are at all inclined to look wiry or stunted; but there is little danger of such a growth if the eyes were properly selected. However, I always like to see them look strong and crisp-like, conveying the idea at this stage of their growth that they would rather break than bend. As they well occupy each successive shift with roots, they must have more pot-room till you get them into the size best adapted for your accommodation. 13-inch pots will grow strong canes that will ripen 8 bunches of Grapes, but it is not uncommon to grow them into bushel pots, and, perhaps, under certain circumstances, it is best to do so; but as these lines are intended for the gardener and amateur who are not over-burdened with house-room, in their case I would say that 13-inch pots are sufficiently large, and as will presently be explained, there is not so much gained by pots any larger.

With regard to soil, I find the Vine roots most freely and makes the most firm and fruitful growth in rather a gritty soil. Two-thirds fibry loam, one-third rotten horse dung, and sufficient road drift or coarse sand to make it feel gritty. This, mixed with a little rough bone-dust, is a choice root medium. The great object is to get the whole ball thoroughly interwoven with a mass of roots, and this soil with the progressive shift system, and good drainage is very conducive to this end.

During the whole season of growth, they must be well supplied with water, and with liquid manure two or three times a-week,—especially after they get their last shift, and in proportion as the pot is small, so must they be thus supplied and fed.

They should be “stopped” as soon as they have run to 14 or 15 eyes, and afterwards allow the laterals to ramble a little, which not only prevents any chance of any of the eyes from which fruit is expected to break, but it very much strengthens the whole Vine, and greatly increases the productiveness of roots. The close pinching system in this case, as well as in many others, is a great mistake. Avoid both extremes. As soon as they show signs of ripening, by becoming hard and brown towards the base, then is the time to

entirely remove, by degrees, the laterals back to one leaf, thus aiding the disposition to inactivity and maturity.

Throughout the whole of their season of growth, they require a high temperature, and full exposure to light by being trained near the glass. This, with the aid of a gentle bottom heat, especially in the early part of the season, and a humid atmosphere up to the season of ripening, will not fail to produce fine strong canes.

By the first of September they will be well ripened, and may be pruned back to ten or twelve eyes, and placed out of doors against a south wall, where they can have the full benefit of a bright sunshine, but from which, and the ingress of worms the pots must be guarded. Here they may remain during the autumn, in the early part of which, (if intended for early forcing, say the first of November), they should have the protection of a greenhouse, cold pit, or whatever such structure your accommodation can afford. It is a common practice with some to allow Vines in pots to become much too dry at the root during the period of rest. This is detrimental to the roots, as also is excessive wet, so it is best to steer clear of either extreme.

The time when forcing is to commence must be determined by that when Grapes are required. Generally speaking, when started early, they take from five to six months; but of course this depends a good deal on the nature of the season, and the amount of heat applied at certain stages—when swelling their bunches especially. If started, say by the first of November, you can easily place Grapes on the table by the early part of April.

Previous to putting them in heat, paint them over with a mixture of cow dung, sulphur, a little clay, and soft soap, made of the consistency of thick paint. This will not only kill the larvæ of insects, if such there be, but will help to maintain the Vines moist till they break, which, thus early, is indispensable. Start with a night temperature of 50° , and gradually increase it to about 68° by the time they are in bloom. After they are set and thinned, you may push them along in mild weather at the rate of 72° , with 10° or 15° more during sunshine.

Till they have broken and formed a few leaves they should be syringed with tepid water, and the atmosphere be otherwise kept moist. As soon as it is seen which are the best bunches, stop, disbud, and remove all the bunches except six or eight according to their size, and then thin the berries immediately they are set, and shed their bloom. The pots should be top-dressed with rotten dung and coarse lumps of loam, and up to the colouring point well supplied several times a-week with dung water.

I had almost forgot to say that when started the pots should be set on a quantity of rich soil, so that the Vines may root through into it, and thus get nourishment, and make up for any want of size in the pot. A simple and easy way of doing this, is to fill a pot of

the same size nearly full of soil, and place the pot with the Vine in it.

In order to obtain dwarf bush Vines to place on the table when in fruit,—perhaps the system originated, I believe, by Mr Rivers of Sawbridgeworth, is the best and most simple—and which cannot be better detailed than in his own simple, but clear and succinct style, as laid down in the “Orchard House.”

“To form these bushes but little care is requisite; a Vine, one or two years from the eye with a single stem, must be selected and potted in an 11-inch pot; then cut down the Vine to within eight buds of its base, the three lower buds must go for nought; the five upper buds, if well ripened, will give each a bunch. The lower shoots should be stopped, their tops pinched off as soon as they are four inches long; the upper five shoots may be suffered to grow till the bunch is perceptible; these may then be stopped one bud above the bunch, and all lateral shoots which will afterwards come forth may be stopped at two buds from the base. No other will be required for the first season than this finger-and-thumb pruning. It is quite possible that some of these five buds may fail to give a bunch; no matter, stop them the same length as the fruit bearing shoots, so as to make a uniform pretty bush. . . . The second season if it be desirable to make a very dwarf bush, the plant may be cut down partially, so as to bring the lowest shoots into action. Cut down through the main stem, below the second or third fruit-bearing spur of the former; it will thus have five or six spurs. Now, on the pruning of these spurs depends success; they will, of course, from being grown under glass, be well ripened, and the buds well developed. Begin at the main stem, and count four or five buds from the base of the spur or divergent branch; the fourth or fifth will, in all probability, be nice and plump. This must be your fruit bud, cut down to it closely; then, with a sharp pen-knife, cut out two or three buds, leaving the terminal bud, and one only, at the base of the spur, close to the stem. This will give you a shoot which is to be your fruit-bearing shoot for the following year. You will thus have on each spur two buds, one for fruit and the other for wood. In autumn, this part of the spur which has borne fruit must be cut down close to the shoot which is to bear fruit the following season, and this shoot must be pruned in the same manner for one fruit-bud and one wood-bud. . . . A vine treated thus will last for many years, and may be always kept a dwarf bush; the main stem, in time, will swell and not require the support of a stick.”

Having thus described the “modus operandi” of forming and fruiting Vines in dwarf bushes for table, he goes on to show that by top-dressing, watering with liquid manure, and allowing them to root through the pot into a border, the same plant can be successfully fruited for many years. The varieties he recommends for bush culture are: — Purple Frontignan, Sweet Water, Purple Fontaine-

bleau, Black Esperione, Grove-end Sweet Water, Cambridge Botanic Garden, the Chasselas Musqué, the Chaptal, and one or two more.

The idea at once presents itself to the mind how beautiful standards, managed in this way, would look in orchard-houses. Managed as standards, there would not be the chance of losing a crop the first season, as the terminal buds of a well grown Vine generally show the best bunches.

X. Y. Z.

CULTIVATION OF LISIANTHUS RUSSELLIANUS.

BY MR D. THOMSON, DYRHAM, HERTS.

(Continued from page 14.)

PERHAPS the most essential point in the successful growth of this plant is a complete state of rest from the beginning of October to the end of January, and that this may be gradually brought about, the plants should, by the second week of September, be set on the surface of the plunging material in the frame recommended for their summer quarters. Having been plunged all the summer, and kept moist at the root, it is of course undesirable to reduce the amount of moisture too suddenly, and in order to do so gradually, they are set on this moist and cool material. The amount of water is gradually reduced as the nights get cooler and the plants cease to increase in size. By the first of October, they are removed to a house or pit where no fire-heat is used, and placed in a dry corner where they can be shielded from cutting currents of air, of which these are at all times impatient. It is not necessary to place them very near to the glass, as a state of repose is what they now most require, so that any light, dry, still situation will suit them very well.

Water is now applied with great care, and is gradually diminished in quantity as the season gets more dull, and the plants arrive at a complete state of repose. By the beginning of November, each plant is placed in a common garden saucer, and throughout the winter there is just sufficient water given to prevent the leaves from becoming more pliable than is natural to them, and instead of applying it in the usual way at the mouth of the pot, it is now applied at the bottom, by pouring it in the saucer—never giving any more at a time than will be sufficient to gradually moisten the ball; and if at any time more is given than the ball readily absorbs, it is emptied out of the saucer. The reason why I recommend and adopt this method of watering in winter is because I have found the *Lisianthus* to “damp off” when watered in the usual way, for when dwarf and well grown, it is not possible to avoid wetting the leaves and to prevent moisture from settling about their axils and round the neck of the plant. And moreover,

this plant has a peculiar tendency to push the majority of its roots down among the crocks, among which they form into coils, therefore a little water is quite sufficient to keep the greater portion of the roots healthy and active, while the top of the ball is often comparatively dry.

Throughout the winter, nothing more than a greenhouse temperature is required; but it is of great importance that they should never be subject to drip, nor damp stagnant atmosphere. A free admission of air at the top-lights, and occasional fires to expel damp is most essential.

Managed in this way, I have always found them to winter well, and have frequently had a hundred or two, and not lost two per cent.; and when spring arrives, they are found reflecting that dark green hue peculiar to them when in good health, and without which, success cannot be counted on; for there are few plants so critical in the doctor's hands as this; once in a diseased and weakly condition, it is rarely restored to vigour. It is a common practice to winter the *Lisianthus* in a stove temperature, which appears quite at variance with its nature. I have always noticed that excitement in winter has invariably killed, or so weakened the vital force of the plant, that when spring arrives you have something analogous in effect to that which is produced by working a man hard all day and then over-tasking him all night too; not only has the necessary rest been lost, but the system has been excited beyond its powers at an untimely season, and general debility is the consequence. I once sent a dozen of *Lisianthus* to a gardener in the autumn, and some time in winter I received an epistle bewailing the death of most, and the ghastly appearance of the survivors, with the sad complaint that they were "drawing," and not getting on at all satisfactorily. They were of course treated to a hot moist temperature, and in this way thousands have been killed, and the poor *Lisianthus* pronounced unmanageable.

Treated in the simple manner which I have just described, a complete state of rest is enjoyed. The dark green colour is preserved, and no growth is at all perceptible, and there is no surer sign of prospective vigour than when they present only a tuft of thick leaves close down to the rim of the pot. In the first week of February they are again set in motion by being removed to a temperature of from 50° to 55°—say a vinery that has been started for a fortnight or so. Here they are placed within a few inches of the glass, and the saucers still retained, and for the first week or two, water is given as described for the winter. So soon as signs of growth are noticed, they are shifted into pots a size or two larger, according to the amount of roots and size of plants, using for soil one-half fibry loam, one-half well decayed leaf mould, with a slight addition of sandy peat and pounded charcoal. In shifting, the crocks from the bottom of the ball are removed with care, so as not to break the thread-like roots, and any loose soil which may be on the

surface. In potting, as much soil is placed below the ball as is consistent with good drainage, as most of the roots are at the bottom. They are again returned to the vinery, and placed at the hottest end of the house. Water is not given for a few days, and the saucers are now dispensed with. In a few weeks they soon make a decided move, and push up a quantity of young shoots, strong and crisp-like, which is an unmistakeable proof that they have taken with, and are enjoying their shift. Water is now given freely, so as to keep the ball regularly in a moist and healthy condition. They are also syringed over head twice a-day.

Immediately the roots show themselves at the bottom of the pot, they are again shifted into pots a couple of sizes larger, using the same soil, with the exception of a lesser proportion of leaf-mould, which is made up with well rotted dung. After this shift they are plunged near the glass in a hot-water pit with 80° bottom, and from 70° to 75° atmospheric heat at night. With increased light and heat, they grow with great rapidity, and are liberally supplied with water, never allowing them to become anything like dry, giving them liquid manure twice a-week. During bright weather, they are aired freely in the morning, and shut up early in the afternoon with 90° to 95° for a few hours. They are vigorously plied with the fine syringe, and the pit well moistened in all its parts, so as to have an atmosphere loaded with moisture. During very bright weather, a slight shading is used, otherwise the tips of the young growing shoots are apt to get scorched when strong and sappy.

A high temperature and abundance of moisture in the soil and in the air are most congenial at this stage of its growth. Some eleven years ago I called on Mr James Cuthill at Camberwell, where I found a whole house full of *Lisianthus*, with the pots plunged in large pans of water some six or seven inches deep, and with a high temperature, and in this way they were thriving well. Mr Cuthill then declared that he had found that in the growing season half-aquatic treatment was the best. But instead of plunging in water in this way, I prefer plunging in "bottom heat," keeping the plunging material always moist, and giving a liberal supply of water in the usual manner.

The size of the pot in which they are flowered is regulated by the size of plant desired. Thirteen inch pots will grow immense plants with four to five hundred flowers. Throughout the whole of its growth it is stopped and re-stopped as it makes fresh growths, and every shoot that is stopped breaks at two or more buds, so that the more rapidly it is grown, and the oftener it is stopped, the larger the plant. When required to bloom in August and September, it should not be stopped after the end of June.

As they show for bloom, and the whole plants become more firm and matured, the moisture both in the air and at the root is diminished by degrees till the bloom nears perfection, when a much lower temperature and a drier atmosphere are needed. They are then

removed to a common stove temperature, where they are watered at the root much the same as a *Geranium* requires when in bloom. They remain a long time in flower, and if required may be removed to the drawing-room or conservatory for a time.

When done flowering, the decayed petals are removed from the seed vessels, and that the seed may come to perfection—which takes a long time—it requires a dry light warm corner of the stove. When the seed gets black and plump, it may be picked and allowed to remain in the pod in a dry place for some time, and the old plants may then be consigned to the rubbish heap.

THE APRICOT.

OF all the fruits we possess, there is not one of more importance in families than the Apricot; whether as a jam preserve, &c., or on the dessert table;—at the same time, it must be admitted that there is not one more precarious or uncertain as to its culture. As this is almost everybody's affair, the first thing I would point to, is its adaptabilities. The great desiderata are heat and light; with a proper amount of these, it succeeds pretty well in almost any ordinary soil; without them, it matters not what the compost or other adjuncts may be—I may refer to their agency again in the sequel. We all know it is now the practice to build orchard houses, and much benefit is likely to accrue from them. I may also allude to heated walls, which they indeed both require and deserve, in all but the more southern counties, whatever a few exceptions may appear to show to the contrary. For culture in pots, or rather perhaps slate tubs, they are eminently adapted, provided such are roomy, and a strong loam be made use of. The time will come, in all probability, when the orchard house and the winter garden will be combined in our principal towns; for this Apricots would be well adapted. They would attain sufficient rest, under the conditions essential to the welfare of a host of good things in the floral world.

Such are a few of the chief purposes for which the Apricot may be employed. I may now advert to the conditions requisite to ensure success. As I before observed, any plan that does not secure all the heat and light our variable climate affords—and that, too, well conserved by such aid as the present state of science affords—will be liable in a proportionate degree to failures. In the first place, shallow or surface roots must be encouraged by all possible means; and these fibres must have an abiding medium, and, according to my ideas, be coaxed upwards about every second year by some kind of dressing: in the next place, all waste shoots in summer must be constantly pruned or pinched.

As to soil, it will be found that a somewhat adhesive loam is best; for if light soils be used, they ought, in justice to the tree and its needs, to be about one-third deeper, in order to avoid the droughts of summer: thus strong soils prove of so much advantage. I will engage that a soil composed of at least three parts what practical men term “a

good sound loam," will maintain a better character of tree, if only 15 inches in depth, than one of light or sandy soil, albeit, more than 2 feet in depth—regard being had in these operations to the propriety of encouraging surface fibres, through the valuable assistance of top-dressings.

Now, let us consider the matter of subsoil, as necessarily connected with drainage principles. This leads me to a consideration of the relation the surface of the border bears to the ordinary surface of the ground contiguous; for we must not confine ourselves to that level. I hold it as sound doctrine, that the farther north a garden is situated, the higher the surface of the ground ought to be; and a given depth being requisite, it requires little discernment to perceive, that the whole volume will be higher up accordingly. Now, bottom water, or in other words, a wet subsoil, will by no means agree with the Apricot—on this I lay the utmost stress. To be more explicit still, bottom water must not rise, at any period, to the lower surface of the soil. I need not here enter into that labyrinthine matter called "drainage;" this has been, as our readers know, a vexing question; but the water must be got away, and without affecting to despise the light of true science, which is assuredly a very different thing from whimsies or conceits, a very little of that old-fashioned thing common-sense will readily accomplish this.

Let me say at a word, that the surface of the border at front is quite six inches above the path, or adjacent ordinary level; and the border rising all the way to the wall, any ordinary mode of drainage will do. Let us suppose that there is a tile drain in front about nine inches below the walk or other level, and cross-drains, about every four yards, playing into it; of course, laid with regard to the outer or main drain, as to the level, &c.; that these drains are rendered secure as to extraneous matters entering, and that the whole surface of them is coated over either by turf, new leaves from rakings, or mere litter, the newer the better; the first I by all means prefer, as being more enduring: but any of the others will do pretty well;—"any port in a storm."

I may now offer a few remarks on pruning, both in the rest state, and in the summer. I will begin with the summer's pruning; for if this is done as I wish to recommend, there will be little for the winter pruner to accomplish. In the first place, let every strong shoot that is superfluous, be pinched when 3 inches in length, in the middle of May, if ready. Let very coarse leaders also be pinched when about half a yard in length; this will be about midsummer. And about the end of July, let all the foreright spray, which is not required to tie or nail down, be reduced by the knife to about 3 or 4 inches in length. Insects have to be carefully extirpated; but of this, a few words in the course of my observations. To sum up this portion of the matter, I may suggest, that from the very infolding of the wood shoots, all waste spray must be well kept under, and that just before the ripening of the fruit a closer reduction take place: the object being to let the light enter the interior of the tree, in order that those little

embryo blossom buds which lie at the base of the spray may have plenty of sunshine, acting immediately upon them.

We come now to winter pruning, which, as before observed, under a proper course of summer management, will be reduced to a narrow compass. It now becomes the pruner's duty to remove what snags or stumps were left at the summer pinching, providing there be no blossom buds upon them. This, indeed, will be the chief business, although shortening some of the leaders may be requisite, in order to fill up bare spaces on the wall. Here let me advise that a final pruning be deferred until the blossom buds commence swelling, for many will be formed at that period, which could not be discovered before. The next point I may advert to is water; for Apricots, like other fruits, have occasional need of this important element. It must here be confessed, however, that this tree requires less watering than many others; and this alone points to the aridity of the climate whence it came, and of course to the great importance of light and heat. Their greatest demand will occur about the period of their commencing their last swelling, and then they should receive it copiously. Mulching is a principle to be attended to, or rather I would say a surface dressing; for mulch, in my vocabulary, means a top-dressing of rotten manure; but surface dressing, a surfacing of compost. Such for the Apricot, I recommend to be composed of half strong loam, and half of a broken and decomposed manure; this should be applied every second year, as before observed. I may now refer to insects, diseases, &c. The red-bar moth causes much injury to this tree, and once getting possession, will keep it if left alone. This deposits its "scales" on the bark of the larger branches, in white oval particles, about four of which would cover a sixpence. Such must be sought for in the dormant season. If allowed to hatch, they produce those caterpillars which cause the foliage to curl up in bunches, and are a fertile source of defective blossoms in the ensuing spring. The aphides or plant lice also trouble their young shoots; these are best combated by tobacco water. Before concluding this chapter on Apricots, I must offer a few remarks on the stocks of Apricots. They are generally budded on the Muscle Plum, a sort of wilding which grows freely; but I have no doubt that we yet lack a proper stock or proper knowledge of some we already possess. There can be little doubt that the dying off suddenly of whole branches, so commonly complained of, is in part chargeable on some discrepancy between the bud and the scion. It is not improbable that imported seed from Apricot countries, the produce of coarse or robust kinds, might aid us here; these should be obtained from a latitude not a great deal in advance of our own. If such were tried and proved successful, there would be a great demand indeed for them, and means would soon present themselves of obtaining them abundantly.

EXTEMPORE.

REMARKS ON THE STANDARD ROSE.

IN continuation of my remarks, page 14 of the "Scottish Gardener," I shall presume that the intended Standard Rose grower has secured from his collector a sufficient quantity of stocks for his purpose; that they are a good stout firm sample, with bark of a greyish brown colour freely corrugated—such being a sure indication that they are possessed of free and expanding properties. Let them be examined carefully as a satisfactory proof that there are none amongst them of a doubtful kind, and that they are perfectly free from any that are *very* young, with a smooth pale green bark, enclosing only a large amount of soft pith, and having more the appearance, substance, and general character of a stout Rush, than that of a good serviceable Rose stock. If any such should by chance have got amongst them, let the planter lay them aside to be ultimately cut down for dwarfs; for to plant such for standards will only lead to disappointment. We must also suppose that he has taken the very necessary precaution of having them carefully laid in to a good depth, (a term readily understood by the practical man) in some sheltered corner convenient to the place intended for their future nursery planting, and that a slight sprinkling of loose litter of some kind or other has been thrown over them, as a safeguard against sharp frosts and cold drying winds, both of which are detrimental to future success. It must be here clearly understood that they are not on any account to remain longer in this position than time and the weather will permit; for the sooner after being collected they are placed in their final nursery position, so much more is success likely to be attained. I am here anxious to impress upon private growers the absolute necessity of nursery planting for at least two or three seasons previous to the plants being placed into their decorative departments. The too common and very unsightly practice that one frequently meets with in gentlemen's gardens, of planting Rose stocks in the position where they are intended when budded only for decoration, is, to say the least of it, anything but judicious, and shows both a want of taste and judgment. A Rose stock, in whatever position it may be placed, is anything but an ornamental object, but when it becomes an addition to the parterre or flower garden, although it may be only for a season or so, it is certainly a very unsatisfactory appendage; besides, success is by no means so certain in such a situation as in a well chosen spot in a nursery quarter; for it is next to impossible that a plant so placed can have the after treatment really necessary; neither are they likely to have that amount of shelter to which they have been accustomed, and which in their present condition they more than require. Let us bear in mind that they will, in their new position require, that is, if satisfactory success be anticipated, a greater share of attention and careful treatment than they would have done, had they been left for

budding in their native habitat. In the first place they have, in all likelihood, just been removed from the shelter of some woodland side or close thicket, where they have been accustomed from their earliest period of existence to an amount of shelter and protection they are not likely to meet with in a flower garden. In the second place, they have been deprived of nearly every root and branch, and are certainly little better than so many stout cuttings, and in fact now require to have bestowed upon them for the first season nearly or quite as much attention. Cultivators should also bear in mind that if once their stocks get into an unhealthy and stunted condition, it is a very difficult undertaking to get them back to that health and vigour which is so desirable in the Standard Rose.

The next object to which I would beg leave to draw attention is the selection of a suitable spot for a Rose nursery; this should of course for many reasons, and more particularly when the cultivation of Standards is intended, be as sheltered from high winds as possible, yet perfectly free to sun and air—a situation that is screened from the north, north-west, and easterly winds, by a rather low plantation of trees and shrubs, will be found a favourable site. There can be no doubt that for our present object, mixed belts of shrubs and trees will be found far better protectors against wind and weather, than are either stone walls or close clipped hedges. The soil most suitable for our object will also require a considerable share of our attention; that which would appear the best adapted for the successful cultivation of the Rose, and that which is almost by universal consent acknowledged to be such, is certainly a rich friable loam, with rather a tendency to adhesiveness; but this we cannot at all times secure, and must rest contented by adding to that which we have already got, such as we think will make it suitable for our purpose. For my own part, I have not found Roses, when budded on the Dog Rose stock, so very particular in regard to soils as many cultivators would lead us to suppose. I have seen them so circumstanced, succeed admirably in a great variety of soils, when due attention has been paid to all their other requirements, such as perfect drainage, manuring, judicious pruning, and occasional removals. As an illustration of this, I may here mention that some of the very best Standard Roses I ever saw, were growing amongst a rather close bank of Rhododendrons, in a fine peaty soil, full of decomposed vegetable matter, having been originally collected from woods where the deposit of Oak leaves had been allowed to accumulate for years on the natural peat of which the soil of the wood was composed. They were in this planted at intervals where an opening could be secured, and were of a sufficient height just to top the Rhododendrons, and in the autumn when these formed a dense green bank, dotted here and there with masses of various coloured Roses, the whole arrangement and the effect produced was extremely good, and the growth so particularly luxuriant, that I have not seen Roses of late years in a more satisfactory position. Their colours were also evidently brighter,

and the flowers of particular sorts larger than one usually sees them in ordinary situations. The stocks on which they were budded, from the strong substance at which they had arrived in the space only of a few years, appeared to be quite at home, and in the very position suitable to them.

Having made choice of a spot likely to suit our purpose as a Rose nursery, whatever be the qualities of the soil that we are from our position obliged to make use of, one desideratum is absolutely indispensable, that is thorough drainage; without this, rest assured that all our efforts will be quite useless. A liberal share of well decomposed manure, and trenching at least 2 feet in depth will be found of equal importance. When the latter operation is being performed, let the manure be placed only a foot under the surface, and not in the bottom of the trench as is too frequently done; this will induce the fibrous roots of the plants to remain in a more favourable position near the surface—a circumstance that will enable us to remove the plants when required for decorative purposes with much greater facility and advantage, than if their roots had been tempted by the influence of manure to a deeper and more unnatural position.

Our next consideration will be the most convenient arrangement of our stocks in this their future nursery quarters. In this there is a great diversity of opinion, and cultivators are mostly guided in this operation by the quantities they may require of each sort, and many of our most extensive growers prefer planting them indiscriminately, tall and short, stout and thin, just as they come to hand, in rows, crossing the quarter from 20 to 24 inches apart, and the plants from 12 to 14 inches apart in the rows—this method gives a break or quarter an untidy and very unfinished appearance, and makes it extremely difficult to select any particular plant that may be required. The best and most satisfactory arrangement I have seen practised for general convenience is to plant them in beds varying in width say from five to ten plants across at the option of the cultivator, leaving good broad paths between the beds for the accommodation of parties selecting—the tallest plants being placed in the centre, and the others gradually diminishing in height to both sides of the bed; the sorts to be worked on the cross rows, and not on the longitudinal ones as is the general custom, and the names of each sort to be attached at one side of the bed, and the number in the tally book on the other—this will be found on many occasions very convenient. If ten plants have been chosen for our width of bed each row will give five pairs; each pair being of a different height, say from 2 feet to 5, this variety in height will generally be found very useful. If more plants are required of any sort, it is only necessary to bud another row and so on. The plants may be placed when planted in this way considerably closer than when distributed in regular longitudinal lines across a quarter, as the broad path by having the dwarf plants on each side gives a facility for inspection of the whole collection that is not obtainable under any other method of

arrangement. The plants should be placed about 12 or 14 inches apart in the cross rows, and about 16 or 18 in the longitudinal; at this distance apart those budding or trimming will have no great difficulty in getting in amongst them to perform all operations required, as from the path it will only be necessary to pass three or four plants at most when the centre is reached, and these three or four generally so dwarf as not to impede the free use of the hands in any way. Particular plants can also be seen very advantageously from the paths without the customary trouble of getting in amongst them; an advantage in point of protection and shelter will also be found in their closer proximation to one another, and yet no obstruction to the due superintendence of all necessary operations. If the locality should be subject to more than an ordinary amount of high winds, an excellent and very useful method to prevent breakage may be advantageously adopted where the above method of arrangement has been chosen, without either much trouble or expense, by fixing in the ground, down the centre of each bed, several upright stakes; on these run a line of rods the whole length of the bed; to these let the centre row of plants be tied, and they, being the highest, will receive the weight of the others from whatever side they may be thrown by the force of the wind.

The whole being now placed in their nursery quarter, they will require little further attention for some time, unless during dry weather, when frequent and liberal supplies of water will be found indispensable; and as the budding season approaches, I shall endeavour to give my practice, should it be deemed worthy of a corner in the "Scottish Gardener."

T. M. L.

GLEANINGS RELATIVE TO FRUIT TREES.

1. *The roots of fruit trees penetrating subsoil.*—When the writer of this note obtained possession of his present garden 20 years ago, he found on a wall facing the south, a Jargonelle Pear tree, in a very rugged and barren state, and deeply infected with canker. As the central stem, about 6 inches in diameter, appeared to be sound, he resolved to renovate the tree, by the method commonly recommended in treatises on Gardening. The diseased branches were cut out; those that remained were shortened; the whole of the spurs were removed; and in the following summer a selection of the resulting side shoots, many of them four feet in length, were laid in at regular distances. These were treated so as to encourage them to produce fruit-bearing spurs; but they continued to grow late in autumn, and did not ripen well. In the second and third year blotches of canker began to appear: at the end of the fourth year, while not one blossom had shown itself, the branches were more diseased than ever. The experiment was abandoned as hopeless, and the tree was grubbed up. Some time afterwards, a drain 6 feet deep, required for the adjacent house, was led across the site of the old tree, and roots were found at the bottom of the drain, and as they were about the

thickness of a small quill, it was estimated that they might have descended $1\frac{1}{2}$ feet farther. The subsoil was what is called in Scotland "till" or "blaes," in short a bed of indurated clay, baked into a squarrose nodular structure by the adjacent trap rocks. The nodules are compact in their interior, varying from the size of an orange to that of a man's head, and separated by numerous interstices filled with softer material of the same nature. Through this layer of indurated clay, which was tolerably dry, the roots of the Pear tree had made their way to the depth of at least $5\frac{1}{2}$ feet, i.e., $7\frac{1}{2}$ feet in all. In these circumstances, it was held that the tree, being too old and large to be transplanted, had been in fact incurable, and that its removal was the only thing that remained to be done.

Not far from the same spot and on the same subsoil, a tree of the Yellow Ingestrie Apple was planted, and flourished greatly, bearing satisfactory crops for 10 or 12 years. At length it has become unhealthy; the leaves assume a yellowish brown tint early in autumn, and the fruit is scanty, small, and spotted. The roots have, without doubt, entered the clay; and the tree must be transplanted forthwith, or it will be useless.

Now what is the theory of these phenomena? It may be said that the annual digging of the borders near the trees in question gave the rootlets a direction downwards; but it cannot be supposed that it forced the roots to enter the clay, much less to pursue their way through it to the extent of $5\frac{1}{2}$ feet as in the case of the Pear tree. The roots must have found nutritive matter in the subjacent bed; yet matter not sufficiently genial to be assimilated in the tissues of the leaves and fruit. It is shown by tables in Dr Lindley's *Theory and Practice of Horticulture*, that in winter and spring the earth at the depth of 3, 4, and 6 feet is warmer than the atmosphere and the surface soil; but, if we remember rightly, for we are quoting from memory, the order is reversed in the end of summer and autumn. May it not be that, in spring, when vegetation is awakened from its annual sleep, the warmth of the lower strata invites the rootlets to enter them; and that in autumn when comparatively colder, the same strata supply crude, and innutritive sap? It is towards the end of the season that the unfavourable appearances generally present themselves. Of course the nourishment drawn from the crevices of indurated clay must be greatly inferior to that derived from the richer as well as warmer soil above.—S.

2. *Another example of Fruit Trees penetrating Subsoil.*—"Three pyramidal Pear trees were exhibited by Mr Rivers, of Sawbridgeworth, and with them the following memoranda. He said:—"The trees (Louise Bonne of Jersey) are from seven to eight years old. No. 1, a tree budded on the Quince, has struck root from the collar of the graft; as soon as this took place, about three or four years ago, all the Quince roots died, for, as will be seen, the stump is quite bare. These (Pear) roots penetrated into the solid calcareous clay to the depth of nearly 5 feet, and so hard was the clay that the spade could not penetrate it so as to take them out to their full length. As soon as these roots struck into the clay the tree ceased to bear, and its shoots became full of canker spots, the leaves more green than those on the Quince roots, and the young shoots more vigorous, although they cankered and died back. Out of a plantation of 2000 pyramids of this variety on the Quince, only the tree now sent and another have struck root from the collar of the graft, and both are in the same state. Last year every tree except these two was covered with the very finest fruit; the tree sent did not bear one, the other produced two or three, which were cracked, spotted, and worthless. No. 2 is a tree of the same sort on a Quince stock, which grew within 5 feet of No. 1; this, in common with others in the same plantation, has no canker, and has borne fine clean fruit. The soil is moist, and brings on moss to a small extent. No. 3 is on the Quince, and is a young tree that has been twice removed. Trees of this kind where the soil is not favourable, and I have a part of my nursery the soil of which is very wet and cold, I remove biennially, giving them a compost of sand and rotten manure. In a few years

their roots become like those of *Rhododendrons*, and keep close to the surface, so that the trees keep in good health and bear profusely. The fibrosity of the roots of the tree sent is remarkable. These specimens were extremely interesting, showing, as they did, that the Quince was better suited for certain kinds of soils than the Pear stock; they also showed how necessary it is to keep the roots of our fruit trees near the surface, and indicated that, under certain circumstances at least to deep rooting we owe barrenness and canker."—*Report of Meeting of Horticultural Society of London, Gardeners' Chronicle*, 1856, p. 791.

3. *Canker in Fruit Trees*.—Every gardener and cultivator of fruit trees knows well the trouble this tiresome disease gives, more particularly with Apple trees; there are, indeed, some varieties of Apples, such as the Ribston, Golden and Newtown Pippin, and the Nonesuch and Old Nonpareil, that in most descriptions of soil defy the care of the pruner, and in spite of cankered shoots being removed and cankered places being cleanly cut out, become so diseased as to be barren and worthless.

Some few years ago I commenced an experimental Apple plantation on a dark coloured tenacious kitchen garden soil, about 2 feet in depth, resting on a yellow unctuous calcareous clay. This site had been planted with Apple trees by one of the earlier members of my family about the year 1720. Some of these trees grew to an enormous size and gave large crops; others, such as the Nonesuch and Old Nonpareil, were in 1820 comparatively small trees, and their heads masses of cankered shoots—occasionally they bore fair crops, but the trees were most unsightly and unhealthy; still in spite of this they lived as long as those of large size, and all died off gradually before 1830. On the site of this old orchard I commenced my experimental Apple garden, feeling that if I could make Apple trees of tender kinds grow without canker under such circumstances it would be a step in the right direction. I therefore planted a piece of ground with young trees grafted on the English Paradise stock (very nearly related to the Doucin of the French), in rows 4 feet apart, and the trees 3 feet apart in the rows; this was about seven years ago.* I allowed them to grow two years, and then had them taken up (all but a few which had not made much progress), and replanted in the same places they had occupied, not pruning their roots unless one long and straggling made its appearance, and giving to each tree two shovelful of charred and burnt earth. My intention was to remove them biennially, but owing either to the pressure of business or forgetfulness, they rested three years unremoved, and only within these few days they have had their third lifting, all having been replanted in the places they were taken from, and I have the great satisfaction of finding my experiment completely successful, for the Old Nonpareil—still a Nonpareil, or rather a Sanspareil in flavour and consistency, *i.e.*, in tenderness and juiciness of flesh—the old Golden Pippin, the Ribston Pippin, the Red Astrachan, the Golden Reinette, the Royal Russet, the Scarlet Nonpareil, the English Codlin, and many others all terribly subject to canker are compact dwarf bushes full of healthy blossom buds, and without a speck of canker on them; their roots are so fibrous that I find their removal does not affect the size of the fruit, in fact some of the largest and finest Apples I had in 1855 were on dwarf bushes on the Paradise stock planted out in March of the same year; and, by the way, I have more than once had some of the finest Pears from trees on Quince stocks removed early in March, and crops on them when all others failed, owing to their blossoming period being retarded by being removed till the danger from early spring frosts was over. This seems to open a new field to cultivators. Pear trees on Quince stocks may be taken up, say in January, their roots laid in the ground, their tops against a north or north-east wall, till the middle of March, and then replanted in their proper situations. Let some of your readers who

* In this soil the varieties alluded to in the text commence to canker when two and three years old.

have shaken off the trammels of old-fashioned fruit gardening, and who dare to build orchard houses, try this.

To return to Apple trees. If larger trees are sought for than those grafted on Paradise stocks are likely to make, trees grafted on the Crab stock may be planted; these will give a larger produce, and by biennial removal can be kept in a perfectly healthy state, even in soils adverse to their culture as orchard trees. It must be recollected that this system is not adapted for orchards where cattle are suffered to graze, but to orchards and gardens devoted only to fruit culture.

I have in my experimental garden two trees that most forcibly exemplify the good effects of biennial removal and the bad effect of deep rooting. I have before stated that my trees remained three years ending last November without being lifted; two trees only have suffered from this, and these are two of the most delicate varieties cultivated in our climate, viz., the Fall Pippin or White Spanish Reinette, and Newtown Pippin, both received from America; they are rapid growers, had both rooted deeply, and have on them large blotches of canker, which, under ordinary circumstances, would soon cause their destruction. I have had their roots brought near the surface, shall out out the canker as deeply as possible, and make them healthy trees. When one looks into our old gardening authors and sees the specifics for the cure of canker, a smile will come, for how simple is the remedy!

It is strange to observe the backwardness of the Belgian and French gardeners in inducing fruitfulness and health in their trees by attention to their roots. I, "once upon a time," made a long stay at Bruges and looked into most of the gardens in and near the town; the soil I found rich, black, and unctuous beyond any I had ever seen, but their Apple trees were masses of canker; they were pruned carefully every year, but their roots having struck deeply into the soil out of the influence of the sun and air, the young shoots were cankered, and large blotches of the disease were to be observed on the stems and old branches; the idea of operating on their roots was ridiculed and treated as a Chinese would a recommendation from an "outside barbarian."

To conclude, it must be borne in mind that there are many varieties of Apples the trees of which are not subject to canker, and which on the Crab stock grow into large healthy orchard trees, or on the Paradise make healthy espaliers, pyramids, or bushes for the fruit garden; but those who wish to enjoy those good old Apples, the Golden Pippin, Old Nonpareil, and Ribston Pippin, should devote a portion of ground to a plantation in rows four feet by three of trees of those sorts on the Paradise stock, and have them lifted biennially in November. If the soil be deep and tenacious, like that in which my trees are planted, a dressing of burnt earth or charred garden refuse mixed with the soil when they are replanted, will be most advantageous; if, on the contrary, it be light and poor, two-thirds rotten dung and one-third tenacious loam or clay, prepared and well mixed during the summer, and two or three shovelful added to the soil for each tree in replanting will give additional health and vigour. The biennial removal I have recommended is but light labour, for an active labourer can lift and replant 40 trees per diem. I need scarcely add that this treatment is equally efficacious for Pear and other trees liable to canker; if a cultivator is inclined to be idle he need only to remove those trees liable to it, and as soon as the disease makes its appearance subject the tree or trees to biennial removal, which is the only cure for canker.—THOS. RIVERS, in *Gardeners' Chronicle*.

ON ICE PITS.

BY GEORGE SHIELLS, ERSKINE-HOUSE GARDEN.

At Erskine House, ice is kept throughout the season at a trifling expense in a circular pit, dug in a dry gravel mound situated on the north side of a

wood. The pit is 15 feet in diameter, and 9 feet deep, one foot at the bottom filled up with branches of trees, covered with brushwood to act as a drain.

Many years ago the late Mr Loudon requested me to send him a description of this pit which I was induced to do,—and I should not have reverted to the subject, were it not that, for some years past, there has been less complexity in the process of filling, by which the expense is reduced, the quality of the ice improved, and its duration increased.

Formerly the ice was broken first at the edge of the pit and thrown in with shovels, and again broken, beaten, and trodden in the pit. Now, the cart empties it direct into the pit, a few planks being temporarily fixed on a decline to carry the ice over the edges and cause it to move quickly to the centre of the pit; the planks also prevent the carts being put too far back. We have four or five men in the pit, which we find sufficient, as all the ice is not broken small—only what is necessary to fill up the interstices. The fall of it from the cart firms and consolidates the mass underneath, especially in the centre. If the frost is keen, it is copiously watered as it is being filled and raised 4 or 5 feet above the ground level; it is then well watered, beat, and smoothed on the surface before putting on the covering of soft bog peat or tree leaves. As it has been, for some years past, inconvenient to get peat moss here, I have substituted tree leaves collected in the wood around the pit; they are used in a half decayed state, which I find to suit very well, covering a foot or 15 inches thick, trodden, beaten, and smoothed off; over this is put a light temporary frame, lightly thatched with reeds or straw, chiefly to protect from rain when the ice is being taken out, for which purpose a concealed aperture is left on the north side, in the thatched covering; no straw is used at bottom or side of the pit. I think sawdust would suit for a covering for the ice, when moss or leaves cannot be obtained. The thatched covering should not be very close at bottom, as a little air passing through does no harm. Although this covering is convenient, I do not consider it indispensable. The ground should slope from the pit on all sides to carry off the water. So managed, we have ice generally all the year round.

THE GARDEN HYACINTH—ITS CULTIVATION IN POTS.

BY MR J. DUGUID, OF MESSRS DICKSON AND SONS' NURSERIES, INVERLEITH ROW.

The original of the garden Hyacinth (*Hyacinthus orientalis*), as the name implies is a native of the East, where it is said to be highly prized on account of the delightful fragrance exhaled by its flowers. It is, however, not only fragrant, but also beautiful, and has for ages been a favourite in the Levant, where it grows abundantly in form somewhat resembling our native Harebells. This allusion of course is only applicable to the Hyacinth in its naturally wild state, as it has been seen and described by travellers who visit the East. The numerous varieties of the Hyacinth as they now appear, are the offspring of the original species since its introduction into the low countries, where it now forms so extensive an article of commerce; so much so, that the Dutch florists may be said to monopolise the whole trade. This, however, need not be wondered at, seeing that they have been the producers of those splendid varieties in their now almost perfect, highly artificial and improved form—producing their flowers either single, semi-double, or double, with colours varying from pure white to brilliant crimson, and some of the very darkest shades almost approaching to black. Before proceeding further with my remarks, it may be as well to describe the general outline of a good Hyacinth when well grown. 1st, The stem should be tall, strong, and erect; the blossoms large, numerous, and suspended in a horizontal direction; each pip or flower should be round and regular, so as not to have a ragged appearance; the petals should be broad, and of great substance, rounded at the points and reflexed, so that the centre of the flower may appear to advantage.

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2d, The foot stalks should be long, and of sufficient strength to enable them to support the flower pips in a vertical position so as to face the spectator, with the pips touching one another, but not confused. 3d, Double flowers should appear regularly imbricated with the centre well up; the outer petals should not reflex so much as those of a single flower, as the second and third rows of petals raise up the centre. 4th, The whole spike should have a bold and massive appearance, round, compact, and pyramidal; the flowers gradually diminishing from the bottom of the spike to a single flower at the top, which ought to stand erect. The flower pips should also be numerous, so that no part of the stem may be seen from the base of the flowers to the top of the spike; neither should the leaves extend much above the base of the truss of flowers, but standing stiff and regular all round the stem with their points somewhat in-curved. The colour, of whatever shade, should be clear and distinct; the striped or mixed colours should also harmonise and blend with elegance. We now see from the above observations what a good Hyacinth ought to be, and what the cultivator should strive to obtain. I shall, therefore, endeavour to give a few remarks on their cultivation in pots, and in so doing, shall be as brief as possible.

Selection of Bulbs.—Let this be done as soon as possible after the importations are announced, selecting such only as are heavy, firm, and sound, avoiding all that appear very flat at the crown—this being a sure sign that the bulb has by some means or other become exhausted, and cannot, therefore, under whatever cultivation, produce a large truss of flowers. Such bulbs as are neither too small nor extra large, but rather of an average size, firm and heavy, with their crowns well up, are generally those that produce the finest flowers.

Season for Potting.—From the beginning to the middle of October is, without doubt, the best season for potting the bulbs; but, nevertheless, if the bulbs are well kept, fine flowers may be obtained by potting at a much later period.

Soil or Compound.—The chief characteristic in this I consider to be an exceeding richness in quality, at the same time so composed as to continue light and porous without binding in the pots from repeated waterings. What I would recommend as a compound, and what I have seen used successfully is the following:—say one part sandy surface loam from an old pasture, one part rotted cow manure, two parts leaf-mould reduced to earth, one part crushed charcoal; add to this say one part of pure pit or river-sand, so as to make the whole sufficiently light and porous. It will also be necessary to use the spade freely in mixing the materials; after which pass the whole through a half-inch sieve, so as to remove any litter that might be prejudicial to the downward tendency of the roots; thus prepared, it may be kept under cover, and used as required.

Potting and After-Management.—The size of pot suited for producing a fine Hyacinth should not be less than five inches in diameter, by nine inches in depth; by this I mean that the roots are to be confined to their own pots, and not aided by the double pot system, which I consider to be extra labour and unnecessary. Hyacinths, however, for early forcing, may be grown in much smaller pots, when the object aimed at is for cut flowers alone. In commencing the operation of potting, see that the pots be perfectly clean and dry, then proceed by placing a large crock on the aperture in the bottom of the pot, above which place a layer of gravel or small crocks two inches in depth; over this place a thin layer of moss, so as to prevent the soil from interrupting the drainage which is equally essential to the Hyacinth as to other pot plants. This done, the next operation will be the placing of the soil in the pots, pressing and settling it gently as you proceed, until within two inches of the top; then cover with a thin layer of sand, on which the bulb is to be placed, being particular in placing it so as the crown may stand exactly in the centre of the pot; then let a little more sand be placed all round the bulb in order to settle it, after which fill up with the soil, so as two-thirds of the bulb may be entirely covered, pressing the soil in this instance

rather firm, and somewhat raised around the bulb or centre of the pot. It will also be necessary to place a tally in each pot, with a number cut in it so as to distinguish the sorts.

I would next suggest that the frame in which the bulbs are to be grown be placed in some perfectly dry situation; then smooth the surface of the ground within the frame with sand, on which the pots are to be placed in rows, leaving however sufficient space between the rows so as to allow the covering material to fall through between the pots. The covering I would use is a mixture of sawdust and sand, which is easily scattered over the pots, filling up the vacancies with but little trouble; continue, however, adding more, until it be five inches higher than the top of the pots. The sashes of the frame are to be kept on, but raised a little at both ends so as to admit plenty of air. They are to remain in this position for four or five weeks; then the covering material should get a gentle watering from the rose of a watering-pot, after which the sashes are to be shut close; neither will it be necessary to give any air for two or three weeks more, by which time they will be firmly rooted in their pots, and in good order for removal to a gentle heat to make their growth. We are now come to that stage in the culture of the Hyacinth in pots, in which the greatest difficulty exists, and in which the greatest care and skill are required. The general error is a too rapid excitement into growth. To avoid this, I would suggest that the heating material, whether it be stable manure and leaves, which is very good, or the refuse of flax, which is still better, in either case see that it be properly prepared before being used—by this I mean that a sufficient quantity of such be put up in a round or rather pyramidal heap, say ten days previous to the time it is intended to make up the bed—by so doing, the violent heat will be evaporated, and the whole mass properly sweetened. In forming the bed, it is advantageous at this season of the year that it be at least one foot broader than the frame, and that the whole be regularly built and treaded from the base to the desired height, say four feet. The frame is now to be removed from the Hyacinths, and placed on the prepared bed, after which a layer of sand three inches deep should be laid all over within the area of the frame. This should be firmly trodden and properly levelled, in order that the pots may stand in their places without further trouble; they may be arranged as before in rows across the bed, and carefully packed up to the ledge of the pots, with the mixture of sawdust and sand. The above arrangement of the pots being completed, it will next be necessary that the soil in the pots be properly moistened with tepid water, and in all future waterings as well as this, let it be distinctly understood that it ought to be applied liberally, and of a temperature as near as possible to that in which the roots are growing. Immediately after the water has been applied, the sashes should be placed on the frame and kept close for a few days, in order to bring up the heat of the bed, after which it will be necessary at all times, when practicable, to have the sashes tilted both at top and bottom, so as to admit plenty of air, and to preserve as far as possible a pure atmosphere within the frame—inattention or carelessness on this head being the general cause of failure. On the other hand, the persevering cultivator who applies his skill judiciously in admitting air at every favourable opportunity, the other items of course not wanting, may be said to be in the possession of the grand secret for producing a fine Hyacinth. To the foregoing remarks I have but little to add that would in any way interest or instruct those who are interested in the pot culture of the Hyacinth. I shall, therefore, only observe, that as soon as the pips on the elongated flower stems show sufficient colour, they may be removed to the greenhouse or conservatory, &c., for purposes of decoration, where doubtless they will be interesting objects for several weeks. As soon as the flower pips begin to decay and become unsightly, the flower stem should be cut away, in order to strengthen the bulbs; they should now be removed to a cold frame, giving water sparingly until such time as the leaves begin to decay; when the pots may be laid on their sides in some dry situation for a few weeks, in order to dry them gradually, after which they may be removed from the pots, their

fibres rubbed off, and their leaves cut close to the crown of the bulb; thus prepared, they may be kept in dry sand until towards the middle or end of October, when they may be planted out in the open ground somewhat similar to other bulbs. The numerous varieties of the Hyacinth which are now recommended to the notice of the public, render it somewhat difficult to give a selection. I have ventured, however, to name a few from each class that will not disappoint the cultivator if he be fortunate enough to obtain good bulbs, and at the same time sufficiently interested and energetic in their cultivation. The varieties marked thus (†) are those best adapted for forcing, to supply cut flowers at an early period of the year.

Varieties with Single White Flowers.

Alba Superbissima	† Madame Tallerand
† Aimable Marie	Mammoth
† Emicus	Mont Blanc
Grandeur A'Merveille	Monarque du Monde
† Grand Vainqueur	† Prins de Galitzen
Grande Vidette	Reine de Holland
Habit Brilliant	Tubiflora
† La Candeur	† Vesta

Varieties with Double White Flowers.

† A-la Mode	Jeannette
† Anna Maria	La D'Esse
Blanchard	La Tour d'Auvergne
Constantia alba	Ne-plus Ultra
† Duc de Berri	Og Roi de Basan
Don Gratuit	Prince of Waterloo
Gloriaflorum Suprema	† Pyrenne
Grand Monarque de France	Venus
Grand Blanche Imperial	Virgo
Grandeur Royale	† Queen Victoria

Varieties with Single Red Flowers.

Amy	† Mrs Beecher Stowe
Bertha Victoria	Ornament de la Nature
Charlotte Marianne	Pyramide Royale
† Cochenille	† Richesse de fleurs
Debits Sabalkanski	Sultane Favourite
Emeline	Tubiflora
Gloriaflorum	† Tasso
Frank Van Berkhey	Victor Hugo
Madlle. de la Valiere	Waterloo

Varieties with Double Red Flowers.

Anna Maria	† Goethe
Albertine	Lord Wellington
† Alida Catherina	† La Vivacite
Bingley	Peruque Royale
† Belvidere	Prince of Wales
Catherine Victorieuse	Satellite
Comte Grouchy	Tige Formidable
Frederick de Groot	Wieland
† Fenelon	Waterloo
Gloria Solis	William

Varieties with Single Blue and Purple Flowers.

† Baron Van Thuyll	Iris
Baron Stieglitz	† Lord Duncan
Charles Dickens	Monument
Cœur Blanc	Nimrod
† Emilius	Nonpareille
Emicus	† Orondatus
† Fleur Parfaite	Richard Cœur de Lion
Grande Vidette	Thunberg
Grand Lilas	William Tell

Varieties with Double Blue and Purple Flowers.

‡ A la Mode	L'Admiration
Bonaparte	Laurens Koeter
Bloksberg	Madame Marmont
Belle Mode	Mignon Van Dryfhoute
Bride of Lammermoor	Prince of Saxe Wiemar
Comte de St Priest	‡ Passetout
Garrick	Perle Brilliante
‡ Jenny Lind	‡ Paarlboot
Keizer Alexander	Prince Albert

Varieties with Single Yellow Flowers.

‡ Adonis	Madame Catalini
Anna Paulowna	‡ Pluie d'Or
‡ Heroine	Prince d'Orange
Jacquín	Rhinoceros

Varieties with Double Yellow Flowers.

‡ Bouquet Orange	Heroine
Cæsus	Lady Sale
‡ Erasmus	Louis d'Or
Gloriaforum	Van Speyk

The foregoing selection from the many that are now cultivated and imported annually into this country, may not include all that are really gems. Yet I think there is a sufficiency of such from each class to satisfy the most fastidious in such matters. Moreover, if the bulbs of such be obtained of good quality, and their management applied judiciously, the cultivator need not despair of placing them before the most competent connoisseurs for critical inspection.

CONIFERS AT CRAIGO HOUSE,

ON THE PROPERTY OF T. MACPHERSON GRANT, ESQ., NEAR MONTROSE.

Read before the Botanical Society, by Mr P. S. Robertson, of Messrs Lawson & Sons' Nurseries—8th January, 1857.

The locality in which the following trees were seen is the park near the mansion house, about two miles north-east of the Dabton station of the Perth and Aberdeen Railway, about four miles north-east of Montrose, and at an elevation above the level of the sea of about 250 (?) feet. The aspect is east and north-east, and commands a very extensive view of the German Ocean on the south, east, and north-east, being distant from the shore at the nearest point about three miles. The country slopes gently from the Pinetum to the coast, so that the trees must be fully exposed during east and north-east winds, to the influence of the sea, having no other shelter than that derived from the fine old hardwood trees which stud the park at irregular distances. Immediately to the west and north-west, the Conifers are well sheltered by thick plantations of Scotch Fir, Larch, Beech, Oak, and other hardwood. These extend in some directions for several miles, a circumstance which tends to modify and ameliorate the cold cutting north-west winds, which sweep along the south flank of the Grampians, the outliers of which come within four miles, whilst the main range is about ten miles distant, presenting to the eye, from Craigo grounds, a magnificent lofty wall, with boldly undulating ridges, and traceable for upwards of thirty miles along the southern face, and indented at irregular intervals with deep glens, which appear in the distance dark and gloomy.

The soil at Craigo is a moderately rich loam, composed of vegetable matter and finely comminuted quartz and granite, containing a great many small shining micaceous particles; this soil being from 12 to 15 inches thick,

The immediate subsoil is stiff and retentive, a circumstance which, combined with the flattish surface of the country tends to retain much of the natural moisture where the ground has not been properly drained. The rock immediately beneath the subsoil is a soft reddish-coloured sandstone, which appears to form very thick strata, dipping slightly northwards, and composing a long ridge running from east to west for some miles. This sandstone overlies a thinner stratum of limestone, which crops out, and is worked for agricultural and building purposes, about a mile south of the mansion. The freestone above alluded to has been worked for building material, and the quarry from which the stones for erecting the house have been taken, is now filled in, and on its site, and also on the heaps of *debris* which have been thrown out, the Conifers are growing. I could not ascertain whether the limestone formation was found near the quarry, but the following trees, having been planted for the last 18 years, are now found.

JUNIPERS.

J. alpina (Endl.), from Northern Europe and Asia, &c., thriving very well, and forming a very pretty low growing glaucous shrub.

J. recurva (Hamilt.), from the Alps of Nepal and Cashmere, a very fine specimen about 12 feet in height, the diameter of the head being about 7 feet, and that of the stem 9 inches, a most ornamental plant of a peculiarly yellow green colour, and gracefully pendant branchlets; it is grafted on the red Cedar, and thrives well, promising to grow to a medium sized tree.

J. Chinensis (Linn.), from China and Japan. (The male plant,) about 6 feet high, and in fine health; producing in singular tufts branches with the two sorts of leaves which so well characterise this species. This plant had on it an abundance of male flowers.

J. excelsa (Bieberst), from the Himalayas. There are several plants of this species from 4 to 6 feet in height, all of which appear to be grafted on the tender *J. Bermudiana*, and in consequence of this they are not thriving, being very spare of branches, and having the appearance of suffering from want of sufficient nourishment. This species, when not grown on its own roots, should be grafted on *J. virginiana*, on which stock it usually thrives very well, and forms a very compact pyramidal tree quite equal to seedling plants.

J. Gossainthanea, from the Himalayas. Of this species there are several plants, from 3 to 4 feet in height, and all thriving pretty well, but none of them have yet formed a good leading shoot; they seem to be grafted plants. The dwarf *J. dumosa* and *J. tamariscifolia* were also planted and thriving very well.

Libocedrus chilensis (Endl.), from Chili. One very healthy seedling plant, about 2 feet high, with very closely set branches, and a good leading shoot.

Thuja Craigana (Balfour). One very good plant, about 2 feet in height, and seemingly quite hardy. This plant is the green variety, sent to Britain by the New York nurserymen, and has quite a different appearance from the glaucous variety discovered and sent home by Jeffrey, and named by Professor Balfour. Murray, who subsequently sent both these varieties from California, states that the timber of the white variety is more durable when used for underground purposes than that of the green, and he observed that the bridge-makers never used the latter when they could procure the former. *Thuja flagelliformis* and *Cupressus torulosa* have both been planted; they seem unsuited to the place. They have been partly protected during winter; but notwithstanding, I fear they will not thrive. I did not observe any other species of *Thuja* or *Cupressus* except *Cup. Goveniana*, which had been planted as *C. macrocarpa* by mistake; this also was looking very sickly.

Cryptomeria japonica (Don), from the mountains of Japan and China, where Thunberg says it forms vast forests, with individual trees upwards of 100 feet high and 6 feet in diameter of trunk—the timber being highly esteemed. Of this tree there are in the collection some very healthy plants, about 8 feet in height, which seem to be now quite hardy, and making vigorous shoots.

I have observed in several places that this tree stands our climate better after it has passed the sixth or seventh year, young seedling plants being very tender.

Pinus Douglasii (Sab.), from north-west America and California. Of this species there is but one large plant—about 25 feet in height; but it is a bad specimen, having originally been a cutting or graft. It never has made a straight leading shoot, but spreads out the side-shoots to a great length. The whole plant has a sort of flat-headed, bushy, half-weeping appearance, very unlike what this noble tree generally attains when grown from healthy seedlings. The tree had on it a good many cones, but they did not contain any fertile seeds. It is quite useless to grow this species from cuttings or grafts; for though these may thrive pretty well for some years, they ultimately lose the central leader—which is the case in this instance—and all the branches, as well as the main stem, get covered with warty-looking vesicles, which, on being cut open, contain a very pure odoriferous resinous juice. The plant has much the same appearance, but far larger, than the old plant in the Garden of the Caledonian Horticultural Society, Edinburgh, and which I would also have taken for a cutting, had I not been assured by Mr McNab that it was raised from a seedling; and he considers it a distinct variety from the common lofty pyramidal form generally grown. I noticed several young seedling plants on other parts of the ground, varying in height from 2 to 6 feet; nearly all of them had suffered during the winter of 1855–56. I infer from their sickly pale yellow look, that they had been raised from seeds produced on young trees in this country, and not the progeny of matured trees. I have for several years paid attention to this subject, and am now convinced that seedling plants raised from seed taken from young trees are generally sickly. This applies not only to *P. Douglasii*, but even to Scotch Fir and Larch, and possibly to all the Fir tribe; and this circumstance makes it a matter of much importance to proprietors in selecting forest trees for timber, as much loss and disappointment ensue, when it is not attended to. There cannot be a doubt but *P. Douglasii* promises, in many districts of this country, to be a most valuable, rapid-growing timber tree. There are already, as is well known, several noble specimens to be met with. There is a specimen at Buchanan House, near Lochlomond; which was planted 18 years ago, being then a small plant, and which is now 60 feet high, 6 feet 10 inches girth of trunk; the branches spread over 30 feet diameter; rivalling already in height the gnarled noble Oaks some centuries old in that park, and it has yet about it all the symptoms of a juvenile plant, appearing as if it would attain to double its present height before it attains the age at which Larch and Scotch Fir are good timber trees. I think this species thrives best in heavy, deep soil, and prefers the west coast and midland valleys to an eastern exposure.

Pinus nobilis (Dougl.), from California; *Pinus amabilis* (Dougl.), from North America. The former of these is about 10 feet in height; the latter 7 feet. Both are very healthy and beautiful specimens, making vigorous leading shoots of about 16 inches each year. They are both grafted near to the surface of the ground on the Silver Fir. I have seen in several collections equally fine plants of both sorts, also from grafted plants; and infer that both the kinds thrive grafted on the Silver Fir. There is much confusion in nearly all the collections which I have been able to visit with regard to what is the true *P. amabilis*. I fear there are only very few such yet introduced into Britain; and what is generally known as *P. amabilis* is only *P. Fraserii*, a very variable species in its habit, and approaching much nearer to *P. balsamea* of Nova Scotia than the fine grass-green *P. amabilis* of North-west America, and which in colour and texture of leaf resembles the Japan Yew (*Taxus Fortunei*). The plant in this collection is, in my opinion, the form of *P. Fraserii*, from the south of Pennsylvania, with thick short recurved foliage, and dingy, greyish-green colour. *P. nobilis* has produced abundance of cones this year at Durris House, Aberdeenshire, and at North Berwick House; the plant at the former place being upwards of 30 feet high, and the latter about 18 feet. The cones produced at North Berwick House

are of greater length and diameter than imported cones generally are. In the Keillour Pinetum there is a very good specimen, 23 feet high, having grown 8 feet since 1850.

Pinus Nordmanniana (Spach.), from the mountains of the Crimea, and those east of the Black Sea. Of this there is a very beautiful plant, raised from seed, and is now 9 feet high; it promises to be one of the finest plants in the collection. Its rate of growth is about 14 inches a year. Its pyramidal outline, fine bushy habit, bent down branchlets, and pure grass-green colour, make it a striking object, even at a distance. I have in several places seen plants nearly as fine, though not so tall, and which were grafted on the Silver Fir. There are some fine seedling plants at Buchanan House 12 feet high. I am not aware that any seeds of this species have yet been ripened in Scotland.

Pinus Webbiana (Wahl.), from the Himalayas. This plant appears to be quite healthy, but only grows about 3 inches each year. Upper surface of the leaves very shining dark green; under surface pale silvery white, as if covered with a white powder.

Pinus Pindrow (Royle), several plants from 2 to 3 feet in height; and *Pinus Pichta* (Fisch.), several about the same age and size. The former of these, according to Royle, grows on the Himalayas, at an elevation of from 8000 to 9500 feet. The latter, according to Ledebour, grows on the western side of the Altain range, from 2000 upwards to 3000 feet. Both are tall growing trees in their native habitats, but are very slow growers in the climate of Britain. The growth of the plants in this collection does not average above 5 inches a year; but what struck me as being a little remarkable, was the great similarity of the two species in this collection. In the young state, as found in nurseries, no two plants can be more distinct; but the plants to which I refer could not be distinguished until you made a very minute examination. *P. Pindrow* here assumed the narrow greyish-green bent leaf of *P. Pichta*; and *P. Pichta* had the leaves longer than is usual, and seemed to approach *P. Pindrow* in the size of the leaves and the habit of growth. Both had a very faint silvery line on the midrib of the under surface of the leaf. I should not be surprised if a form be yet discovered on the western portions of the Himalayas or the southern limits of the Altain range which will unite these two apparently different species.

Pinus Pinsapo (Boiss.), from Spain, on the mountains of Granada. One small plant, about 2 feet in height, but growing very slowly.

(To be concluded in our next.)

GLASS STRUCTURES.

We can see evident signs of the great extension the building of Glass Structures is to undergo by-and-bye. Already something has been done, but I opine what we see is but a glimmering of the light that is to come, and I think it the duty of every one to help forward the good cause as much as is in his power.

Not to touch at present on the construction of plant houses, let us turn our attention to houses in the kitchen or fruit garden. Now, the rule I have laid down to myself in regard to this branch of horticultural buildings, is to get as much accommodation at as little cost as possible, always having a due regard to strength and durability. I have often regretted to see money uselessly spent in decorating houses meant for the every day uses of forcing, thus confounding forcing-house erection with conservatory building. It may be said this does no injury to any one, if the parties concerned are satisfied, but to this view of the case I demur. Say, a gentleman wishes to build some forcing or fruit houses; he naturally asks his neighbour, who has already built, about the cost. When told, he is either frightened altogether, and builds none, or builds fewer houses than he would like. Until of late years,

hothouse building and heating have been in a manner monopolies, or at least in the hands of a few; but luckily gardeners are beginning to understand more about these matters, and can, in a great measure, prevent their employers' money from being wasted. The time must come when every gardener will be able to be his own garden architect. Who can understand the requirements of the gardener so well as himself? What gardener needs to be reminded of conservatories in which plants perish by the hundred, or of vineries with four or five feet of upright glass in front?

But I have digressed, and must return to the kitchen garden, and the structures of which it is the fitting position; and as our communication must be of reasonable dimensions, I shall confine myself in the meantime to what are fashionably termed Orchard Houses. Of these I have seen several, not any of which would yield anything like a supply for a gentleman's table. I call them good things for the amateur who delights as much in the culture as in the eating of fruit; but your fox-hunting country gentleman likes to see fruit on his table, let the trees be where they may. I would suggest to all who have good gardens with walls well filled with good healthy bearing trees, as all walls ought to be, who have more fruit than they know what to do with one year, and next to none for two or three years, that if these walls were covered with glass, the fruit grown in the otherwise barren years would soon pay the cost of the covering, or at least a very good per centage on it. Having done something that way, I am able to say about what that cost is, or ought to be. The walls covered here are 13 feet high, and the distance of the glass from the wall at the bottom $6\frac{1}{2}$ feet. There are ventilators the whole length of the wall at the top; and also in the front wall, which is really all ventilators. There are no rafters, the astragals being supported by a strong iron rod running along the middle of their length, and "butted" to the wall by strong iron supports; forming a light, and at the same time, strong roof; all constructed of best Baltic timber, glazed with 15 oz. sheet glass. This cost 14s per running foot of wall, end sections, masonwork, &c., included. In other words, 50 yards of wall covered for £105. I need not tell gardeners that a good Peach, Pear, or Apricot wall covered thus pays a very good per centage on the outlay, commercially speaking; besides the pleasure of having fruit in such a season as the past, when fruit could not and cannot be purchased except by those who really do not regard expense. I shall be glad to give working plans of these wall coverings should they be thought useful.

E. D. G.

ON THE CULTIVATION OF THE GARDEN PELARGONIUM.

BY MR A. COSSAR, MUNGO'S COTTAGE, CULROSS.

In order to grow large and fine specimen plants, the second week in February is the best time to put in cuttings. A strong short-jointed shoot that has no flower buds set on it, should be taken and prepared for planting, by being cut clean through at a joint, the leaf at which should be taken off, and three buds left to break with their leaves retained, and the cutting should not be topped; when the cutting is topped, the bud at the top is likely to push during the time that the cutting is rooting; which will be against its future success. The best soil for cuttings, is equal parts of leaf-mould and river sand, sifted fine; pots two inches wide, and the same in depth, are the most suitable. When the cuttings are put into the pots, the soil should be pressed firmly around them, and a good watering given them overhead. They may then be put into the propagating house under hand glasses; they require little bottom heat, and if there is not the convenience of a propagating house, they will root in the house where the old plants are growing; but in either place they require to be covered with glass. Care is required to keep clear of

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damp; if the glasses have a moveable top, that may be taken off and the inside wiped dry; if not, the whole glass ought to be taken off and dried inside. The cuttings will not be the worse of being exposed to the free air of the house for a quarter of an hour or so, while the glasses are being dried. Being covered with glass inside a house, shading is not much required; still, this must be attended to, so as not to allow the cuttings to flag. Treated in this way, the cuttings will generally root in three or four weeks, or little more; when rooted, they should be taken from under the glasses, and placed in a shaded situation in the house for a few days to harden off. In the third, or at latest the fourth week in March, the plants will all be rooted and hardened off, and should be immediately shifted into pots 4 inches wide. As the *Pelargonium*, when well managed, is a strong growing plant, it consequently requires a rich soil of an open texture, which may be prepared as follows:—One half rough turfy loam, the other half, equal parts of cow, pigeon, and farmyard manure (all two years old), leaf-mould, and river sand, well mixed together, but not sifted. A handful of fine bone dust should be added to a bushel of the above mixture, and a few rough pieces put in the bottom of each pot over the drainage. In shifting, the plant when taken out of the pot should have its roots around the outside of the ball relieved from the compact soil by the sharp point of the tally or potting stick, and carefully put into the new pot to the same depth, but not deeper than it was in the previous one; the vacancy filled up moderately firm with soil, and a good watering given overhead to settle the earth in the pot. The plant should now be topped, leaving three good eyes to break from, and afterwards put into the house in an airy part, as near the glass as possible.

By the middle of June, the plants will require another shift, and should be put into pots 6 inches wide; soil the same as that formerly used. At this shifting all the shoots are cut back to two or three eyes, and tied out to sticks. The plants at this season will grow better in a cold frame, than in any house; the frame should be raised on bricks, one under each corner. The sashes may be drawn off during the day in dry weather, and tilted up at the back during rain, but always put on at night. The plants should be taken back into the house by the middle of August, previous to which they should be re-potted into pots 8 or 9 inches in diameter; the same soil used as before. At this shifting, the shoots which the plants have made in summer, should be tied out to sticks, taking the outside ones first, and leaving one or two, in no case more than three, to fill up the centre; after being tied they should all be stopped again to two or three eyes, and left so as to make the plant as uniform in the top as possible. The plants should have plenty of room in the house, and placed near the glass. Air may be left on the house all night, if the weather is favourable, till the end of the month, which will prevent the plants from drawing up weak; this will happen if the house is kept too close, immediately after the plants are taken in from the cold frame.

As winter approaches, care must be taken to keep out frost. Air is necessary during the day, and ought to be given on all favourable occasions; but frost at night and frosty winds during the day must be guarded against. The thermometer ought never to fall below 42° during the night. When, from a continuation of hard frosty weather, a good deal of fire-heat is required at night, the plants will be benefited by being sprinkled over-head in the morning with water, which should be put into the house the night before, so as to bring it to the same temperature. The water used in watering the plants at this season ought also to stand a night in the house before being used. Should a continuance of wet or damp weather set in, which sometimes happens at this season, a fire occasionally during the day, when air can be given, will be of great service. Treated in this way, the plants will thrive well in winter, and will make fine specimens for flowering in the following summer. If it is desirable to have the plants in flower by the month of June, they should be looked over the first week in January—if in July, in February—when the side-shoots should all be tied out, and the centre ones also regulated, and all topped. Those in the centre may be left a little higher

than the outside ones—this forms a round head; if a flat surface is wanted, the centre shoots may be cut further back. By the middle of March, the plants require to be shifted into their blooming pots. These may be 12 inches in diameter, and the same in depth; using the same soil as that recommended for the growing season. As the plants have been a long time in their last pots, their roots will require to be freely relieved from the compact outside of the ball of earth. The plant should not be put any deeper in the new pot than it was in the previous one.

The flower buds will now be making their appearance, and a regular training is necessary. The outside shoots ought to be well drawn down, and the centre ones also properly arranged, but not topped. This finishes the course of training; and if properly managed, the plants will be fine specimens in June, averaging 4 feet in diameter, and 2 feet high from the rim of the pot; clothed with healthy dark green foliage, and covered with from fifty to sixty trusses of magnificent flowers. If the plants are required for competition, all bees or insects, of whatever kind, must be excluded from the house. Shading is also necessary, as a strong sun injures the colour and bold appearance of the flowers.

The *Pelargonium* requires a liberal supply of water; still, the soil in the pot must never be allowed to become sour. As a general rule, allow the plants to be in want of water, and then water freely, for if the water is given in dribbles the surface of the soil in the pots may be moist when the roots are perishing for want; and if too much water is given, particularly after the plants have been newly shifted, the soil will become sour. On this depends much of its success. If the soil previously mentioned be used, and the plants regularly shifted, little manure water is required; the only time this may be necessary is before the plants are shifted into their blooming pots—for if the plants are growing freely, the soil may then be somewhat exhausted. The house best adapted to the growth of the *Pelargonium* is a span-roofed structure, with upright sashes eighteen or twenty inches high, with a table on both sides, and a passage in the centre. The tables may be 3 feet 3 inches wide, and the passage 2½ feet; the roof sashes made so that they can be pulled down, and the side ones also to open so as to admit a free circulation of air.

As the above remarks apply only to large specimens, should small plants be required, or plants in a certain sized pot wanted, cuttings for such purposes may be put in in June or July; shifted once or twice as occasion requires, to keep them growing, and finally into their blooming pots, either 6 or 8 inches wide, in March. These will make good little plants in summer. It is difficult to get a large healthy plant in a small pot. Manure water is a great help, and will so far assist the growth of a plant so situated, but it cannot equal a shift; and a large plant in a small pot, with sickly foliage and stunted bloom, is not much to be desired. The *Pelargonium* is liable to suffer from the attack of greenfly. When these pests make their appearance, the house should be shut close up at night, and fumigated with tobacco or tobacco paper. This should always be attended to when the fly makes its first appearance, and particularly just before the plants come into flower; for if this is not done, and the plants require to be smoked when in flower, the flowers will all fall off, and a week or two will elapse before the flowers are so full on the plants again; and it often happens that they never look so well all the season after.

NOTES ON NEW CHRYSANTHEMUMS.

BY MR LAING, DYSART HOUSE, DYSART.

That the *Chrysanthemum* is improving no one can deny, although not so rapidly as could be wished: still there is no want of new varieties, but by the time they are weeded, there are often but few left. It is, however, unfair to discard a new flower the first season, as they cannot be thoroughly proved from the weak plants generally sent out by the raisers late in the season; and even some fine sorts require peculiar treatment to bring them to perfection,

as may be instanced by Two-coloured incurved, which I have grown since 1849, and never got a passable bloom off it till 1855, when I grew it in a fourteen inch pot, trained against a south wall, housed it as soon as the buds were properly set, and cut the bloom from it; which was in my winning stand at the Caledonian Society's Show in December of that year, and measured six and a half inches over. Such flowers, are, however, not to be commended—the nearer we can get them to Queen of England and Alfred Salter in habit, size, and quality of bloom, the more they will be appreciated.

The following are some of the best new sorts, and although a goodly list, must be grown:—

LARGE FLOWERING SORTS.

Alfred Salter, delicate rose blush; a most splendid flower.
 Antigone, fine white, but not much incurved.
 Aristee, fine incurved lilac.
 Cardinal, bright amber, incurved.
 Desdemona, reddish salmon, fine full flower, splendid for conservatory.
 Elizabeth, fine incurved white.
 Lothario, light claret, incurved.
 Marquis Melleville, fine incurved white; petals in the style of Defiance.
 Souvenir, light cinnamon, incurved
 Stellaris globosa, carmine crimson and white; small, but beautiful.
 Vulcan, fine, incurved, ruby red.
 Luteum formosum (*alias* Yellow Formosum and Webb's Delight), bright golden yellow; first rate.

ANEMONE-FLOWERED VARIETIES.

Captain Montels, large, dark salmon, buff; fine.
 King of Anemones, purple crimson, gold centre; extra.
 Madame Sentir, white, with yellow centre; beautiful.
 Marguerite de Norway, reddish salmon, yellowish centre; very bold and fine.

SOMFONES.

Antonious, hybrid Anemone, bright, gold; very good.
 Boule de Nieve, pure white Anemone; first rate.
 Flavie, beautiful dark gold Anemone, with fine high centre.
 Faudrette, rose, lilac, and white; good.
 General Canrobert, clear yellow, free flowering, and first-rate.
 Margueridetto, rose lilac Anemone; first-rate.
 Mrs Westwood, a pretty lilac Lilliputian.
 Mr Deschamps, large flower, canary yellow, fine high centre.
 Mr Dale, fawn and purple; fine form.
 Madame Mazines, silvery lilac, exquisite form, beautiful, quite distinct.
 Misette, a true Lilliputian, a perfect ball, pale sulphur, abundant bloomer.
 Perle Toulousiane, beautiful hybrid Anemone, rose, with high centre.
 Scarlet Gem, a perfect gem, crimson-scarlet dwarf, free and early; first-rate.

“DO EXHIBITIONS ENCOURAGE HORTICULTURE AS THEY OUGHT?”

BY MR D. THOMSON, DYRHAM PARK, HERTS.

Under this heading there is, in last month's *Florist*, a reference to some fancy Pelargoniums exhibited by me at the last June show of the Royal Botanic Society, in the Regent's Park. The nature of this reference has induced me to ask for a space in your pages to say a few words concerning it, in conjunction with the report given of the same plants in the last July num-

ber of the *Florist*. I was urged by many to notice the report in question on its appearance, as being inaccurate and unfair; but I did not do so, and certainly should never have troubled myself about it. It then appeared to me a matter of very little importance, so far as I was concerned, what the inaccuracy and unfairness of the report were, until the reference in last month's *Florist* called my attention to the matter afresh, and has induced me to trouble you with a few remarks. It is true that for the sake of anything in the matter that may at all affect myself, I might still keep silent, but truth and justice are to be regarded by all. Admitting that, if it is a duty to respect the claims of our neighbour, it is also a duty to respect our own; and this faculty acts fairly and legitimately in behalf of others, only when it acts in the same manner on its own behalf. And, may it not be said, that in due maintenance of what is right and fair is involved the practicability of all our duties; although this is a truth that is pregnant with fear and trembling to despotisms of every shade and colour.

As to the report of last July, it is observable first of all that the "variety" of *Pelargoniums** is pointed to as being by no means "attractive," an opinion I am not now going to call in question; the same variety was, however, in the collection of the Messrs Fraser of Lee Bridge, which took the second prize at the Crystal Palace last May, where only a Turner could be first. It was also in Mr Bousie's collection on the same day; and, if any inference can be drawn from *italics*, in the opinion of the *Florist*, Mr Bousie's plants deserved the first prize, which was decidedly my own opinion; and if my memory serves me aright, this variety was staged in the Regent's Park by Mr Turner in 1855 (or it might be 1854). If I am in error in this matter, I hope I shall be corrected. None of these gentlemen are novices in the selection of sorts to do battle with at these great shows. Certainly this sort has lost some of its attraction, by comparison with newer sorts. It is stated that these plants did not "form what is termed a head of bloom," but the fact, which must be patent to all who looked at them, that there were masses of bloom-buds not expanded is, shall I say, forgotten by the reporter of the *Florist*. These plants were grown for a special purpose, and had I been able to have exhibited them the following month, it would have been seen whether they formed not only a "head of bloom," but a back, a front, and two sides (a thing which is not always visible), and that, too, without the aid of a single stake. Three weeks after they were exhibited, they were seen by scores to be literally bloom, and nothing else in appearance. It is current enough that they were very little more than half blown on the day of exhibition.

The report states that "considering the large pots they were grown in, their size was not very wonderful;" yet it is expressed with the preceding breath, "from their immense size they created quite a sensation." This sensation must have been great in proportion as the plants were great compared to anything seen before. Mr Fish, in the *Cottage Gardener*, speaks of them as "huge plants, which created such a sensation," &c. A gentleman who is alike above falsehood and flattery, and who has been at the top of the horticultural profession, and has had the direction of the most successful exhibition in Great Britain for years, declared that he had no conception that "fancies" were capable of becoming so large. And when I state that I have a plant of the same variety in a pot exactly 12 inches in diameter, which now (8th January) measures three feet in diameter, crowded with shoots about three inches long, in want of tying out, it may safely be left to the public to judge what might be the size of the plants in question on the 18th of June, in pots 18 inches wide, by 16 inches deep; though they did not then appear so large, nor were they actually, as when the extreme blooms—which are always the latest—were open, the first week of July. The main object for which I was urged by so many to exhibit these three large plants, was to show that large symmetrical plants could be grown without stakes; but of this the reporter of the *Florist* steers quite clear, though it

* Princess Marie Galitzin.

was distinctly stated; and forgets, too, that they were not one-sided plants, trained to a "face," but alike full all round, and covering the pots a third way down. Last of all there is the happy comparison of my four plants, with one in Mr Turner's collection, as having more bloom than the four put together; but according to our way of counting in this country, there were only three plants. This was a fortunate "hit" for the magnifying of the one plant in the imagination of those who read the *Florist* only, and did not see for themselves. The *stupidity* of the judges who awarded them the "silver medal," though no prize was offered, is the only thing overlooked. If they were right in all the other Pelargonium awards except this, it was, perhaps, a matter of little consequence.

Turning now to the reference of last month, which for the sake of accuracy I will quote—"That the great metropolitan shows have done very much for the advancement of horticultural science no one can deny, although occasionally we see great mistakes committed, as shown in the three large fancy Pelargoniums, exhibited by Mr Thomson at the last July show in the Regent's Park. In this instance, we saw that by giving plants too much pot-room, overpotting them, the object the cultivator had in view, of obtaining masses of bloom, was frustrated, and an exuberance of growth was the result. It must have been evident to all that a great mistake had been made, for in the immediate vicinity of these plants were other plants nearly as large, and completely covered with bloom, in pots about half the size. The metropolitan shows form a great school in which the science of horticulture can be studied," &c. Here it will be noticed that these plants only are singled out from among all the Geraniums and other things which have appeared at the metropolitan shows, and it is strenuously made to appear that "a great mistake was committed." Why not point to the mistake of the judges, which must have been "great," in awarding a medal where none was offered, and while they are instructed to withhold from "great mistakes," even when prizes are offered? It is observable, again, that the name of the grower is coupled with the plants, while the names of other exhibitors of bad cultivation at other shows are never mooted; to be sure the names of Mr Edwards and Mr Sivewright are alone mentioned in connection with fine Dahlias, and pardon is politely asked of the latter gentleman for alluding to his "very fine plants." It must be evident to many that the full object of this reference is something more than the "encouragement of horticultural science." The fact that these Pelargoniums required at least 14 days under a June sun to bring them full into flower is not noticed in this case either—that could not serve any purpose except that of fair play! Certain *other* plants in pots not half the size, are declared to be "nearly as large;" but it will require no great penetration to see that the statement from first to last was all on one side, and that it carries in its right hand an evident contradiction. If there is to be exactness in an inference, there must be exactness in its antecedent propositions. No conclusion can lay claim to truth, that is not dependent on truths that are themselves absolute. The geometrician requires that to deal with straight lines, they must be veritably straight. Let us apply these rules to the statements of the above quotation. It will be found that the propositions stand thus—the pots these plants were grown in were very large, the result of which was an "exuberance of growth," this was the "great mistake." The other plants were in pots about half the size; there was no "exuberance of growth" in their case, or else they must have been mismanaged also. The question then arises, how in pots half the size, with no exuberance of growth, they could be nearly as large as those in the large pots, with an "exuberance of growth." Let it not be supposed that I am casting a shadow of reflection on any other Geranium at that show; and even were I so disposed to find fault with anything which comes from certain quarters, I would excite the ire of a certain party, and be very much in the position of Anaxagoras, who had to fly his country for blasphemously asserting that the sun was not the chariot of the deity of Helios.

Surely if the metropolitan shows are to be the great schools for the study of horticultural science, some of the schoolmasters need not assert their own proud position by falsifying that of their pupils, and dragging them down to show what great and mighty pedagogues they are themselves. But depend upon it they must make the best of a necessity, and must be conscious of the inevitability of the progress of other people as well as themselves. Is it not disgusting to see that tendency to a sort of practical atheism, seeing no guide but ones self, playing the god, and from that stand point deciding what is good and what bad. It is easy, as it is common, to pay lip homage to right principles, having at the same time so little faith in everybody and so much in themselves that they would, if it were possible, chain the sun and earth together lest centripetal force should fail. Coercive education is both wrong and impolitic, and is certainly not the surest way of gaining a power and a position high above all on whom it is brought to bear.

In conclusion, as to whether the object I had in view in growing these large plants was frustrated, this is best known to myself, and the scores of people who saw them during the month of July in that position for which they were designed, and I am quite sure that if the object for which they have been so "harped on" and misrepresented in the *Florist* has been gained, it will do the writer no good and me no harm; but the substratum of inaccuracy and want of fairness is to be deplored.

ENGLISH VERSUS SCOTCH HORTICULTURAL EXHIBITIONS.

BY MR SHEARER, YESTER GARDENS, GIFFORD.

"Do Exhibitions encourage Horticulture as they ought?" Such is the title given to an article which appeared in your contemporary, *Turner's Florist*, under the editorial "we," wherein the writer criticises somewhat sharply the plants which are exhibited at our country shows, particularly the north. In many of the writer's remarks I entirely concur, but the cause or causes are not so difficult to find out, I think. "The great shows held in London have done much for the advancement of horticultural science," says the writer, which I do not deny; and he points out the mistake of Mr Thomson of Dyrham Park, where he exhibited three large fancy *Pelargoniums*, wherein too much pot-room had been given. I have no desire to be Mr T.'s champion, as he can well defend himself. But I have no doubt had Mr T. grown them for competition alone, they would have been treated differently. He grew them for his employer's gratification, to continue flowering for some time, and not got up for the day to take a prize far above their value. The writer then notices Oxford, Derby, Manchester, &c., "where plants were exhibited as specimens of horticultural skill worthy of a high position at the Crystal Palace and Regent Park fetes." Halifax and its surrounding neighbourhood he elevates and then pulls down with a crash, "as many of the specimens had not received the thought and attention necessary to good culture; and in Glasgow the same results are visible." But Newcastle-on-Tyne seems to have risen, or rather sunk, to dishonour in the eyes of the writer. The *Verbenas*, *Achimenes*, scarlet and fancy *Geraniums*, must have been horrible. The Newcastle folks must speak for themselves, or look out the next time the same gentleman comes among them "taking notes." For the consolation of all those who have not seen the Metropolitan Shows, I say, do not be cast down. All the writer says may be true enough; but remember there is a "wheel within a wheel," and no doubt it is desirable for the writer, as well as you and I, reader, that the science of horticulture should progress.

Having read the flaming reports of the Metropolitan Shows, where everything seemed to be perfection, I was induced to visit the Crystal Palace Show last September, that I might see for myself; and without depreciating the abilities of any of the exhibitors, no doubt they showed their best; but judge of my surprise when I saw *Verbenas* there which certainly did no credit to the exhibitors. Did the writer observe the pots they were in? Did he observe the few flowers on each plant? Was it like good pot culture to plunge

the pots in a bed, training the plants on a wire trellis, allowing the roots to push from the joints into the soil, and there grow to be pulled up and exhibited as specimens of pot culture? Were the *Achimenes* really better than those at Newcastle-on-Tyne; if so, then all should have been on the rubbish heap. There was not a well-grown *Achimenes* in the Crystal Palace, in my opinion; and I ask the writer, was there a single well-grown *Fuchsia* in any of the lots? Scarcely a single expanded flower was to be seen on some of the plants; with the exception of one of the lots of *Liliums*, all the rest were very poor indeed. I might go over a number of things that were not beyond mediocrity, which surprised me much, as I expected to see such wonderful things; but I forbear. The exhibitors themselves had no idea of self-praise, and they may well exclaim—Save us from our friends! Two years ago, I heard one of the staff of your contemporary remark, not without cause, of the want of accommodation for the exhibitors to arrange their pearls, &c. for the Exhibition table. When I arrived at the Crystal Palace, I expected to see temporary tables erected for that purpose; but no. Here was a celebrated *Dahlia* grower sitting on his own box for nearly four hours dressing his flowers. Here Mr Fleming's man with all his fruit in boxes around him on the floor getting them arranged. Here Mr Ledyard the same. Why did the writer not see this? just because he has got familiarised with such things, and they pass unobserved. I entirely agree with the writer on the absurdity of withholding the exhibitors' names from the judges, as if the name of the person would have any influence on the opinion of the judges. It is quite true that the hand-writing is generally known, and does not prevent that which is intended.

I have no doubt Mr Sivewright's *Dahlias* were really what the writer describes, "as really the finest plants he had seen;" well done, Sivewright, you have kept up the honour of Scotland for once! Did you not tell him that if all, or a part of the gentlemen in Scotland were as enthusiastic, and paid as much attention, and encouraged the science of horticulture as you do, much more would be done? Did you not tell him that while he got pounds* for a prize, we the Scotch got only pence? Did you not tell him that if the same amount of prize money were given in Scotland as in England, it would make a very great difference in the appearance of the exhibitions? I would have asked him if he would exhibit say six or twelve of these fine *Pelargoniums* for as many shillings as the number of plants, and the expense of carriage there and back more than the whole prize, and no prospect of gain otherwise. If the writer was so treated at the Metropolitan Shows, I am afraid his ardour would cease also, and we would have less of that "you puff me, and I puff you," which seems a prominent feature in some of your contemporaries, because it would not be worth the trouble of writing or printing it. If the writer can put us on any plan whereby we can raise the "needful" money, we shall be very glad; if not, we must add to the already large list of our "Scottish grievances," that our horticultural shows are not supported as they ought to be by those who are most benefited by them.

January 20, 1857.

FERN S.

Catalogue of British Ferns, &c., by Charles Howie, Nurseryman, &c., St Andrews.
Catalogue of Alpine Plants, Hardy Ferns, &c., by Robert M. Stark, Nurseryman,
Edinburgh.

Priced Catalogue of Exotic and British Ferns, by Robert Sim, Nurseryman, &c.,
Foot's Cray, Kent.

The cultivation of Ferns has of late come greatly into vogue among amateurs, and deservedly, for this class of plants is a very elegant one, and it has the additional charm that some of the kinds are very curious, and of rare occurrence. The interests of botany, too, have led to these collections; some of the species in a dried state are of difficult determination; and like Willows and Wild Roses, Ferns are most easily studied, when growing together. Of a delightful four day's excursion last autumn to Moffat, which is the centre of a good Fern district, one of the most pleasing incidents, so far as plants are concerned, was our visit to the manse garden of Kirkpatrick-Juxta, where among other things we found a *Filicetum* tastefully arranged

and rich in hardy Ferns. It was interesting to see the minute Spleneworts, the rare Woodsias, the various Shield Ferns, and the "Queenly Osmunda," all growing vigorously in one little vicinity. The two curious Filmy Ferns we found in a dark nook in the greenhouse, and they were brought forth like some strange tortoise or reptile, by the reverend incumbent, who is at the same time an excellent minister and an accomplished botanist and entomologist.

While viewing this collection, and more particularly in examining the catalogues, whose titles are prefixed, we felt ourselves rather behind the botanical world. The martinets of science have been very busy in this quarter; and whatever other improvements they have made, they have been very successful in changing names. In our own time our liege mistress the Lady Fern has been called *Polypodium*, *Asplenium*, *Aspidium*, and now *Athyrium*; and her brother Filix-mas, *Polypodium*, *Aspidium*, and lastly *Lastræa*. Our old acquaintance *Pteris crispâ*, which, in Lightfoot's days, was an *Osmunda*, we learned to call *Cryptogramma*, under the spray of the Grey Mare's Tail, where on the slopes leading to the waterfall it grows by the road; and lo, the spray upon us was hardly dry, when we found that it had become quite another sort of thing, viz., *Allosorus*. But however perplexing these variations may be, the names themselves are rather favourable specimens. What do our readers think of such names as *Pycnopteris Sieboldii*, *Didymochlaena truncatula*, *Aneimidietyon Phyllitidis*? The Fern to which the last pair of names belongs—making together ten syllables—is a greenhouse plant about a foot high! Assuredly if we had it we should keep it out of sight on some back-shelf, that we might never, by any chance, be asked what it is called. Surely lady amateurs must be in danger of losing their teeth while trying to pronounce such barbarous terms. Barbarous terms—we must recal the words, for the generic names of Ferns are nearly all veritable Greek; but yet such a concatenation of Greek syllables, as is only to be paralleled in the grotesque combinations of the comedies of Aristophanes. The poor plants have not deserved such treatment. They are all very harmless, and many are very beautiful. But let us look to the catalogues before us.

Mr C. Howie of St Andrews is known for his devotion to the coy flora of *Cryptogamia*. His unpretending list is confined to British Ferns, of which he enumerates 70 species and varieties, besides nine Fern Allies.

Mr Stark has earned the reputation of being one of the most scientific nurserymen in the United Kingdom. He has cultivated rare plants with an attention which only a thorough love of them could inspire. Added to his very interesting catalogue of Alpines, he has given a list of nearly 100 hardy Ferns and Allies, at very reasonable prices. It gives us pleasure to observe that though a man of real scientific culture, he does not affect the fopperies of the modern nomenclature on which we have commented above.

Mr R. Sim's catalogue is a much more elaborate production. Including numerous exotic sorts, and a considerable number (46) Fern Allies, he gives the names of 447 species and varieties. There is probably not such another collection for sale in the world; and we suppose that no more numerous collection exists in this country except at Kew. Mr S. accompanies the names with brief popular descriptions, unbotanical indeed, but such as are likely to be agreeable to amateurs. The only thing we desiderate is a more particular indication of the habitats of the various kinds. The catalogue gives a vivid idea of the enthusiasm of its author, and of the taste of the Fern fanciers, which we do trust sufficiently repays him. We take the liberty of transferring to our pages the following instructive remarks on the cultivation of Ferns, which are the best that we have seen:—

"It should be borne in mind that there is, in the case of stove Ferns, the same necessity for a period of rest (induced by lower night temperature in winter than in spring and summer) as in that of other stove plants. But this important point in stove Fern culture is too often overlooked, and if any difference of temperature occurs, it is rather the result of chance than of intention, and as a consequence the plants literally live too fast—2 or 3 years' growths are compassed in one year, and the result is drawn, weakly fronds—so tender indeed, that a little sunshine, damp or extra air at once disfigures or destroys them: 55° to 60° at night in winter will keep any stove Fern, in this Catalogue, in good health, and prepare it for a vigorous spring growth.

"Air, too, should be regularly given, in moderation, in summer, to lessen the effect of excessive sunshine. This particularly applies to July and August—when artificial heat ought to be entirely discontinued, and the stove fernery, for a while, cease to be a stove in point of temperature. Such a structure, if kept quite close during bright sunshine, will, though shaded, be unbearably warm, and many of the Ferns in it will speedily show that its close heat is more than they require. Moreover, in such a close and high temperature it is scarcely possible to spend an hour, without an amount of personal inconvenience that very much detracts from the

gratification every Fern-lover feels in a leisurely and frequent inspection of his collection.

Soil.—The peat, which must be the basis of the compost, ought to be of a rather spongy and very fibry nature—such as Orchid growers use, and which abounds in decayed moss, fibry roots, and the decaying creeping stems of the Common Brake—avoid the close, heavy, dark-coloured kind, which, when very wet, becomes a dark muddy mass. For small Ferns no loam need be added, but for large-growing kinds in large pots moderate-sized pieces of yellow turfy loam, with the herbage decayed, and used in moderation, is decidedly advantageous, as it retains moisture longer than peat does, and in consequence many of the tiny roots will cling to the pieces of it. Enough of pure white sand should be used to give the compost a slightly sandy appearance. Let the relative proportions be of peat at least two-thirds—of loam one-third or less. To keep the mixture porous, and to secure proper drainage through it, add to it a liberal portion of free stone; or better still, and everywhere accessible, well-burnt cinders—proportioning the size of the pieces to the size of the plants. The compost must not be sifted.

“(In the hardy fernery—out-of-doors—the soil is not of so much consequence as in pot-culture. It may be composed of decayed leaf-soil (where peat cannot be got) and loam, and for large-growing kinds even loam alone would do. If peat, however, can be procured, by all means let it form half the mixture.)”

Water.—A too frequent impression prevails that water may be unsparingly used in pot-culture, and in carrying that impression into practice the soil is often reduced to little else than bog-mud, and as a matter of course, all the more delicate and most succulent kinds perish—hence one cause for the supposed difficulty in cultivating many *Cheilanthes*, *Nothochlamys*, &c., and the frequent loss, in winter, of the gold and silver *Gymnogrammas*. The right practice is, not to allow the fronds to droop from dryness of the soil, but as soon as its surface looks and feels dry, give water at once and enough—not little and often—and if the drainage and compost are right, the soil may be touched, a few minutes after watering, without soiling the fingers.

“The drainage in the bottom of the pot need not exceed one-fourth of its depth. Syringing, or sprinkling (in either case as slightly as possible, and with rain-water), the foliage of all Ferns, excepting the very succulent and small hairy kinds, that are cultivated under glass, is very advantageous, if practised once or twice daily during the warmest summer weather.

Insects.—The two greatest pests to the Fern grower—Thrip and Brown-scale—are not easily extirpated. The Thrip seriously disfigures the fronds; to destroy it, remove the most infested fronds, and fumigate the others often, but cautiously, with tobacco, or use tobacco-water, adding to it a little black sulphur, and applying the mixture with a camel's-hair brush, syringing it off again in a few hours—repeat the application till all trace of it disappears. The Brown-scale should be removed by hand: if the Fern is much infested with it, cut away all the fronds at once and remove any traces of it on the new growth.”

“Glass-covered Fern-cases are too frequently kept as close as though the plants were undergoing a long sea voyage, and required the total exclusion of the external air. This is the chief cause of the Ferns in so many of these very interesting structures having a drawn and untidy appearance, and the glass soiled and obscured by the condensed moisture. Perhaps the following hints may be useful:—**Case** for the soil should have a perforated bottom, and be made to fit into, but not to touch, the bottom, of a water-tight outer one, having an appliance for removing the drainage-water occasionally.—**Soil.**—The same as for large pot Ferns (see above), to be raised considerably above the rim of the case, and to rest on at least an inch of large cinders or other pieces of porous drainage material.—**Air.**—Admit occasionally, but not on very dry sunny days, as it is then desirable to retain the internal moist air. Small glasses may be slightly tilted on one side; large ones must have special ventilators.—**Water.**—As air is given occasionally, and the case has a perforated bottom, there will be a moderate escape of moisture from the soil, and that will have to be replaced at distant intervals, and then only when the surface gives slight indications of dryness.—**Planting.**—Nothing is eventually gained by crowding the plants and leaving no room for future growth.—Occasionally wash and well dry the glass, replacing it quickly.”

Hymenophyllum Tunbridgensae, and **unilaterale** (Wilsoni): and **Trichomanes radicans**—all filmy Ferns—require peculiar culture. Soil—very fibry and spongy peat, with plenty of freestone, or well-burnt cinders (not less than inch-pieces) intermixed—2 to 3 inches would be ample depth—the bottom of the pot or pan to be filled with drainage material only. Raise the soil considerably above the rim, and secure the plants on, not in, it; keep always moist, but not stagnant; cover with a bell or

other glass, and screen from sunshine. These filmy Ferns require more atmospheric moisture than other Ferns generally do; they should therefore be grown in a case by themselves, as few other kinds succeed well under the close treatment necessary for these."

SEED CATALOGUE FOR 1857.—That issued by E. G. Henderson & Sons, of the Wellington Nursery, St John's Wood, London, has just come to hand, and a better got up or more carefully arranged list of agricultural and horticultural seeds it has not been our privilege to peruse. Excellent practical hints are given as to the best mode of cultivating a variety of plants, their heights, colour, and characters described, and the price attached to everything; and, in the way of novelty, cuts are given of no fewer than 20 budding and pruning knives, with numbers and prices attached, so that a gardener can select his favourite description of knife, and write for it, as easily as he can for an ounce of any seed. Altogether, this Catalogue comes up to what our ideal of such is, and is every way creditable to the extensive and highly respectable firm that has issued it.

BLACK BARBAROSSA GRAPE.—I am sorry to be able to corroborate but too strongly the statement of your correspondent with regard to the Barbarossa Grape, and to add to his complaint of the leaf losing colour, that of the fruit never attaining it. There are at this place some strong young plants of it, all of which had their leaves more or less colourless or discoloured if we may so term it; on one of these plants there were, this past summer, five bunches of Grapes weighing about four pounds each, the berries of which swelled finely, like small Plums some who saw them remarked, but they were miserably deficient both in colour and flavour. I am promising myself better luck next year, having "close spurred" them. I do not expect so large bunches, but I hope to have them up to the mark in colour, but I fear the flavour will always be indifferent. I will not give up the growth of it without a few years' trial, for if it can be got nearly up to its character, it will prove a most valuable Grape, as it hangs so well and is so showy.—E. D. G.

AMATEURS' AND COTTAGERS' GARDEN.

An important and busy season is fast approaching; and, in giving directions in this sphere of gardening, there is scarcely a point that ought to be urged with greater earnestness than that of trenching deeply all ground intended for Vegetables; it is a fact, that in the amateurs' and cottagers' garden this operation is deplorably neglected. How often is it the case that the ground is dunged and "botched" over with a half-worn out spade, year after year, leaving the subsoil as hard as adamant, and converting the top spit into a laboratory for slugs and all such pests. If the gardener was correct—when a gentleman entered his garden once, and asked for the head gardener, when he took him to the muck heap and exclaimed, "there, that's head gardener." I would venture to say that deep trenching is the "right hand man." Presuming that all cultivated soil is well drained, trenching is of vast importance in the production of finely grown produce. In a dry season the roots penetrate more deeply into the ground, and thus escape in a great measure the evil influence of drought. In wet seasons, the water escapes more freely into the drains, and thus obviates the opposite evil of stagnant moisture. These, to say nothing of the action of the atmosphere producing important chemical, and for the time, mechanical influence, are important results. I say then, whether you have it in your power or not to dung heavily, trench as deep as your staple will allow, and if your staple is shallow, and your subsoil cold and clayey, dig the subsoil and leave it in the bottom in a rough state. It cannot be too widely made known to all who till the soil, that Parkes' patent steel fork, is the best tool known to dig with; not only do they work the soil better, but the work can be done with a third more speed and ease to the performer. And what so effectual in dispelling a fit of nervousness, and those disordered sensations which not

unfrequently distort and confuse the soul, as a burst of trenching, which is much lessened in severity of exertion by those new forks, and rendered more a sort of desirable exercise to maintain the mind in intellectual vigour. I mean these latter remarks for the amateur, who is often too apt to smoke his pipe and roast his shins, till his mind becomes a nest of mental pestilence.

Should the weather be at all favourable, and the ground in working order, get ground for Onions, Parsnips, Carrots, and Cauliflower, well manured and trenched, leaving the surface in a rough state. A night's frost or a drying wind, will reduce it to a mealy state, and these crops can be got in by the end of the month, weather permitting, excepting the Carrots, which may be left for a few weeks longer, and this, too, applies to the Cauliflowers. In the meantime, if not already done, get in a sowing of Peas and broad Beans. Few Peas are more to be recommended (to those who have no ground to spare for some of those which are a few days earlier but give scant crops) than the double blossomed Early Frame. Sow in rows 4 feet apart on some warm rich border, and a row of round Spinach may be sown between each row. Marshall's Dwarf Prolific is a first-rate early Bean, and may be planted two feet apart. The amateur who has a greenhouse or pit may gain time by sowing them in pots or boxes, and transplanting them when about three inches high about the 1st of March. Sow also a bed of Wood's Early Frame Radish in some warm nook, and cover with a little dry litter in severe weather. A few rows of Ashleaf Kidney Potatoes should also either be planted at once, or put in some warm light place in a box of leaf mould or light soil to "spring." All ground intended for Potatoes should, if not already done, be trenched up and left rough for the present. Cover up Seakale with pots and leaves, or long dung—a very little warmth will bring it on nicely now.

GREENHOUSE, &c.—Beware of admitted currents of frosty air among any description of plants. Camellias now blooming must be copiously supplied with water if at all pot bound, otherwise they are apt to drop their buds, and at best do not last so long in flower. Geraniums that were not sufficiently rooted to shift last month should be shifted this; allow them to become dry previously and pot firmly, thin out all superfluous shoots and foliage, and tie them well out. Shift on Calceolarias, for these use a rather rich soil, and pot them a little deeper at every shift; a gentle heat would be of service to these. If such is not attainable, keep them in the warmest end of the greenhouse or pit. Cinerarias in want of more pot-room must also be attended to at once.

Pot off all bedding varieties of Geraniums, Verbenas, shrubby Calceolarias, Ageratums, Petunias, &c., and where more stock is required, a small hotbed for striking should be got ready by the end of the month. Those who contemplate a start in the way of Cucumbers next month, should by the middle of this month get some stable dung and leaves mixed up and frequently turned over, to be in good order by the first of March, when perhaps you can procure a pot or two of plants from the nearest squire's gardener. But after all, there is nothing like self-dependance and determination to succeed.

ERRATA.—In the 19th line from the bottom of last Cottagers' and Amateurs' Garden, read "thinning" for "pinning." And for Mr "Brown," at Page 11, ten lines from top, read Mr "Burn."

CALENDAR OF OPERATIONS FOR FEBRUARY.

VEGETABLES.

The weather of late, between sharp frost and heavy rain, has not been favourable for garden operations: presuming, however, that wheeling composts and manure was carried on during frost, trenching and digging can be done in open, dry weather; it is of importance to reserve a little of such work, when it may be too cold for other operations. A sowing of Peas and broad Beans should be put in if the ground is in a proper state; a few Ashleaf Kidney potatoes, for forcing, should be planted in a frame with a very

slight heat; keep up a supply of Asparagus, Seakale, and Rhubarb, not forgetting Mushrooms; if the weather is mild, they will now grow more kindly. Give abundance of air to Cauliflower in frames and hand-glasses. The pruning of Gooseberries, Apples, &c., should be about over; new plantations, where required, should be planted as soon as possible; the pruning and nailing of wall trees should be carried on when the weather is mild; it is almost lost time attempting it in cold weather, and is little short of cruelty to animals.

FORCING DEPARTMENT.

PINES.—If all has gone on favourably, most of the early fruiting stock will show their fruit this month. When you see the centre leaves spreading out, you will see, on looking into the heart of the plant, the embryo fruit making its appearance. At this stage there can be nothing more fatal than to suffer them to get too dry at the root, and they must, therefore, be steadily supplied with moisture, giving occasionally liquid manure in a clear state. Where there is sufficient accommodation to admit of devoting a compartment to those now started exclusively, it is best, as they require a less humid atmosphere till done flowering than growing stock, and fruit which may be swelling off. Range the night temperature at 65° still, more especially if the weather be severe, and let it rise to 75° with sun heat by day. Now is the time to look over the general stock of succession plants, and all those in small pots must be shifted the first opportunity, but by no means shift any plant that is not well rooted and healthy. The soil used should be dry, a fibry loam, without anything added to it, and be pressed rather firmly about the ball; strong suckers on plants from which fruit has been cut during the autumn, should now be potted in pots proportioned to their size; pot firmly, and give no water till the roots reach the sides of the pot. In plunging these, as well as newly shifted stock, see that the bottom heat is steadily secured at from 80° to 90° at the highest; keep them rather close for a few days after potting, and if on fine days the inside of the pit appears dry, give a gentle syringing to walls, &c., but do not yet moisten the plants much; regulate the temperature for these a little below that recommended for fruiting stock. Any suckers that yet remain on old stools, and are still small, had best be left on the parent plant; scale off some leaves from the bottom of the stool, remove the surface soil, and add some fresh; give the plants a good watering, and plunge them to the rim. In this way, they will progress rapidly.

VINES.—Thin the early Grapes as soon as the berries are the size of a Radish seed; thin sufficiently at once, leaving the largest berries that have the shortest and strongest foot stakes. In thinning out the superfluous bunches, remove all that have long shoulder stalks, leaving the roundest and most compact bunches. They are less likely to shank, and always dish up the handsomest; remove laterals and superfluous shoots, and get the growths neatly tied in their permanent places, so that no more tying be required; maintain a night temperature of from 65° to 70° by night, when the weather is mild, allowing a rise of at least 10° by sun heat, and keep a humid atmosphere, especially in the afternoon and at night. Vines in bloom should be kept at about 65° at night till fairly set with a dry atmosphere. Succession vineries just started should be kept thoroughly moist, and have the rods syringed till fairly broken; begin with 50° at night. Pot Vines started early will be swelling their bunches, and should be liberally treated with liquid manure, and if wanted soon, may be rattled along with 5° more than that recommended for permanent Vines. If not already done, set eyes in motion directly for another season, plunging them near the glass in a bottom heat about 80°, being very careful to keep them regularly moist till they make roots. In all Vine structures, give more or less air daily, stirring up the fires early in the morning, enabling you to air in the early part of the day, and closing up early with sun heat, and attend to thorough cleanliness and order.

PEACHES.—Trees in bloom should have a liberal supply of air. Houses just commenced, will require but little fire heat in mild weather. Syringe the trees twice a-day with tepid water; those in a more advanced state, should have a good syringing when fairly set, and disbudding proceeded with by degrees.

ORCHARD HOUSE.—Things in this house are now on the move, and may be encouraged with a little fire-heat, but be rather sparing than otherwise. Things that are in bloom had better be classed by themselves, so that they can be kept drier and well aired. The latter element is essentially necessary to this department; otherwise, a debilitating effect will be the result. A mild temperature of from 45° to 50° , should be aimed at, throughout this month. It is found that nothing is gained by forcing hardy fruit trees in pots, and that much is lost.

STRAWBERRIES IN POTS.—Where the fruit is set there should be an increase of temperature to from 60° to 65° at night, and liquid manure may be applied twice a week. Those in bloom should not be kept warmer than 55° at the highest, and should be well supplied with fresh air, avoiding by all means, currents of cold air over the blooms, or they will not set. Continue to introduce into colder houses a successive stock, according to the demand. Where these are extensively grown, by far the best way is to have compartments for themselves; there is much more certainty, and a vast amount of labour saved, in not having them to move from one temperature to another.

CUCUMBERS AND MELONS.—Cucumbers that have been in bearing all the winter will now be very much benefited by a top-dressing of rotten dung loam and road grit in about equal proportions. There is no plant that “roots up” so fast as the Cucumber. These should be encouraged with a few degrees more heat, now that the days are longer, and there are more chances of sun; range about 72° to 75° at night, shutting up in the afternoon with 10° more. Should these flag a little on bright days, as they often do after a dull season, be very backward in shading much; rather give less air and more moisture, both at the root and in the air, for the sooner they are able to bear a spring sun, the sooner will they gain strength, and yield finer Cucumbers. Those sown early last month will be fit to plant out about the middle of the month. In preparing a pit or house for them, let the soil be open, light, and rich, and about ten inches deep, and when planted out, give more or less air daily, and nightly too, and as soon as they reach the trellis, stop and restop them, and they will soon show fruit. Range the heat as directed above. A sowing of Melons should be made for early summer supply, in a temperature of 70° . Golden Perfection, Golden Drop, and Victory of Bath, are good early sorts.

FLORISTS' FLOWERS.*

CINERARIAS.—Plants in bloom at the present time, and those coming forward will be greatly benefited by an occasional application of weak liquid manure, let this be as near to the same temperature of the house in which they are grown as possible. Those intended for specimens, should have their final shift at once; tie out the side shoots, shift on those in small pots, and where there is any appearance of mildew, dust with sulphur; keep down aphides by occasional fumigation. Give air when the weather is favourable.

DAHLIAS—Where a large number of plants are wanted, the general stock should be put to work at once; take off cuttings when about 3 inches long; these strike readily in a moist bottom heat. Dung ought now to be got together in quantities, and prepared for frames.

PELARGONIUMS.—Large plants ought all to have their final shift; those will now begin to grow freely; tie out the side shoots as they advance, so as to keep them neat and uniform; pay special attention to watering at this season, see that none suffer from the want of it. Keep the temperature of the house rather warm— 40° to 45° . Give air when it can be done with safety; shift on young plants; stop any that may be required for late bloom.

* By Mr J. Downie, of Downie & Laird.

ing. Give the plants sufficient room, and attend to cleanliness in every department; destroy insects as soon as they are observed.

HOLLYHOCKS.—Roots potted in autumn will now be pushing up cuttings, if a large stock is wanted, a little fire-heat will be found beneficial, but this must be carefully done, for if too much heat is given, foliage and not cuttings will be the consequence. Take off cuttings when they are about 3 inches long; pot singly, in small pots; use a rather rich sandy soil, and place in a mild bottom heat.

PANSIES IN BEDS.—When a thaw sets in, look over the beds, and any plants that may have been thrown up by the frost, gently replace again. Stir the soil occasionally between the plants. Pansies in pots.—Remove the lights on all occasions in fine weather, so as to keep them perfectly hardy. The strongest plant should be potted towards the end of the month; see that the soil is in proper condition before using, as on this particular, much of the future success of the plant depend.

CALCEOLARIAS.—About the middle of the month shift on those plants intended for specimens. In shifting keep the plants well down in the pots, so that the side shoots may be encouraged to send out rootlets. By all means keep down greenfly; remove all decayed foliage; give air on all occasions when the weather is favourable. Take off cuttings of any of the finer sorts towards the end of the month; these will be found to root freely in a gentle bottom heat.

AURICULAS.*—First mild weather, commence top-dressing; remove the surface-soil carefully, to the depth of about an inch, taking care not to injure the fibres, and fill up with the compost recommended last month. While the necks of the plants are bare, examine and see that there is no disease; rub off the eyes or embryo offsets, that the plants may be kept up to blooming size, and endure a strong bloom. Brush off any larvæ of greenfly that may be adhering to the leaves, and clean out the stages; doing this effectually, may be the means of keeping this pest away for a season. When the plants are top-dressed, give a moderate supply of water to set them a-growing; continue to do this regularly during the absence of frost. During mild weather give plenty of air. Sow seed as soon as possible.

RANUNCULUS.—Commence to get the beds in readiness for planting; have the surface made a perfect level. Take advantage of the soil being dry, to have this done satisfactorily. After the middle of the month, take advantage of the first fine weather, and commence to plant. The distance between the rows may be either 5 or six inches, and the number of roots in the row of a 4 feet wide bed, of the strong growing sorts, 10 or 11 will be sufficient; the weaker kinds will require one or two more. To ensure success in the cultivation of this most beautiful flower, it must be kept in mind, that the crowns of the tubers be planted exactly $1\frac{1}{2}$ inches beneath the surface. To insure accuracy, I know nothing so effective as a piece of smooth wood, with notches cut at the ends the required depth. Mark the surface soil with the board, then cut out the soil with a flat trowel, as near the depth as possible; and, by pressing the board into the drill till the notches rest on the edges of the bed, it will show whether the bottom is level. In planting, handle the roots carefully, so as not to break any of the claws; push them gently into the soil, till the crowns are about level with the bottom of the drill; return the soil previously taken out, and level it. So soon as the bed is planted, look over it, and fill up any inequalities with some dry soil, till the surface is quite level.

TULIPS.—The spikes of the early sorts will now begin to show above the surface, and by the end of the month the later sorts will be up. Guard against rain and frost, for fear of canker. Tulips are safe at this critical time, when the soil is in a dry state. Should canker appear, remove the soil from the diseased plants, and with a sharp knife cut away the diseased parts; choose a dry day to do this, and allow the cuts to dry thoroughly before the soil removed is replaced with some light fresh soil.

* By Mr G. Lightbody, Falkirk.

CARNATIONS AND PICOTEEs.—During the month give only a moderate supply of water, and that in the morning, and in the absence of frost. Keep the plants free from decaying leaves, give plenty of air when the weather will permit, but keep off cold withering winds. Attend to the turning of the compost, looking out for wireworm, grubs, &c.

PINKS require no further attention than to keep plants in the open ground from being broken over by wind, or thrown out by frost. Give those in pots water as required, and keep them clean.

NOTICES TO CORRESPONDENTS.

W. P.—Give your Strawberries when in flower, all the air possible in fine weather; water carefully.

F. FORREST.—The Countess of Burlington is by far the best of the white corolla'd Fuchsias. *Volcana de Aqua* is probably the best of the new dark varieties.

PAUL RICAUT.—The following thirty Auriculas are all fine varieties in their classes:—

GREEN EDGES.

- † Beeston's Apollo
- † Clegg's Lady Blucher
- † Dickson's Duke of Cambridge
- † Lightbody's Sir John Moore
- † Do. Star of Bethlehem
- † Ollier's Lady Ann Wilbraham
- † Oliver's Lovely Ann
- † Page's Champion

WHITE EDGES.

- Ashworth's Regular
- Campbell's Robert Burns
- Gairn's Model
- † Lightbody's Countess of Dunmore
- † Do. Fair Flora
- Summerscale's Catharina
- Taylor's Glory
- Do. Incomparable

GREY EDGES.

- † Beeston's Fair Flora
- † Bone's Perfection
- † Chapman's Sophia
- † Cheetham's Lancashire Hero
- Fletcher's Ne Plus Ultra
- Richard Headly
- Syke's Complete
- Waterhouse's Conqueror of Europe

SELFS.

- Barker's Nonsuch
- Berry's Lord Primate
- Headley's Royal Purple
- Kenyon's Freedom
- † Lightbody's Meteor Flag
- † Spalding's Blackbird

The newer sorts are marked †

To prepare Peb for frames, spread it out in thin layers; have one pouring on water, and another beating it with a grape at the same time. When it is thoroughly wet, throw it together into a heap, and let it lie for two days. Another way is to steep it in water; but the former is preferable. After the frame is put up, let the heat fairly up before the plants or cuttings are put in, so that the oily vapour may pass off.

Cow-dung from a pasture is preferable to that collected in the cow-house. As to the time required for its being in a fit state for potting purposes, much depends on the management. The following plan we would suggest. For getting it decomposed in as short a time as possible, frequent turning and exposure to the weather, more especially during frost, will greatly facilitate its decomposition; it may, by this process be in a state for using at the end of twelve months. If wanted earlier, after the heap has lain for some time, the outer crust may be removed, and so on, before every turning. This may be safely used for potting purposes, in six months.

R. R., Newcastle.—The following twelve Antirrhinums are really fine varieties. Others might be mentioned, but they are so sportive that they cannot be depended upon to come true.

Conqueror	Mrs F. A. Snipp	Black Prince
Lord Raglan	Constance	Model of Perfection
Lelia	Hendersonii	Queen
General Simpson	Cretia	Yellow Model

J. R.—For Gooseberries, Raspas, and Currants, there is no better manure than old hot-bed dung, dug in round their roots. If the Strawberries have been more than two years on the same piece of ground, make a fresh plantation next August on a piece of land well trenched, and having a heavy coat of good rotten dung dug in before planting. This is far more effective than manuring old beds, and the fruit will be much finer.

THE SCOTTISH GARDENER.

THE PEONY.

"AND she has cheeks like a Peony Rose":—such is the scornful climax with which a spiteful non-admirer winds up his account of the charms of a rustic bella. The Peony has accordingly become the type of what is called "a barn-yard beauty" in Scotland. We are inclined to think that some injustice is thereby done to both parties. Dousabel, as the poet Spenser calls her, may be a very worthy person in her way though her cheeks are of the reddest. She may be better suited indeed for a cottage than a drawing-room, but that may be more owing to her training than her person; for, had she been accustomed to the latter sphere, it is very likely that she would have been called an Aurora beauty, and sonnetteers would have written of her sapphire eyes, and damask cheeks, and tresses of golden twine. We are not knight-errants; it is not our business to champion "lightlied" maidens; but we do protest against the degradation of the beautiful family of Peonies by odious comparisons. It may surely be admitted that an amount of colour, which is deemed excessive in a female complexion, may be by no means too much in a brilliant flower. Lord Bacon, than whom no man had ever a more luxurious delicacy of sensation, in his essay on Gardens, mentions the double Peony as one of the prime ornaments of the parterre. It is said that on its first appearance in Holland it was sold for 12 crowns a plant, a prodigious price considering the value of money at the time. The fine old jolly Peony has been a special favourite with the young for nearly three centuries. We will not have his good name spoken away by spiteful tongues. Much less will we allow his undeserved disgrace to be reflected on his relatives who, coming from Siberia and China, deserve a more hospitable welcome; and from their extreme beauty are well worthy of it. Believing that Peonies have fallen into unmerited neglect in the present day, we shall endeavour to call the attention of our readers to the kind and amount of ornament which they afford;

and we shall do so by offering a series of remarks on the principal species.

Pæonia officinalis, the common Peony, is a well-known plant with large globular flowers, which in different varieties are found from deep crimson to faint blush fading away to almost white. There are also some anemone-flowered varieties; but these are still rare. This species is less adapted to the flower garden than to the shrubbery or pleasure ground. In the latter situations it will flourish for many years, with little or no culture, provided the soil is hearty; and when left to itself, the stems often assume a somewhat recumbent form, presenting their large grave, spherical flowers, like the faces of so many cubs around a lioness. It blooms very well under the shade of trees. The single varieties of this species, and some of the others, such as *P. humilis* and *P. corallina*, are very elegant, but they are more fugitive than the double forms. These sorts should never be massed together. We believe that it is the planting them in beds in the Botanic Garden fashion, for which they are ill-fitted, that has brought them into comparative disrepute. Had we the command of an extensive pleasure ground, we should keep a large bosky tract, into which spade or hoe should never be allowed to enter, and where scythe and rake should be admitted only after the fall of the leaf. Among Mahonias, and wild Roses, and a few scattered deciduous shrubs, we should have the vacant spaces of grass filled, in spring, with Snowdrops, and Crocus, and Daffodils, and in summer, with Harebells, and Columbines, and in the more open flanking spots, with troops of Peonies of all shades. In such localities, nothing is more wearisome than the priggish intermeddling which would trim everything into artificial shape. There may be as much thought and skill expended in ornamenting a gay wilderness, as in decking a ribbon flower plot with gaudy colours.

P. tenuifolia is a very distinct species, with finely cut leaves, and vivid coloured crimson flowers. The single variety unfortunately continues a short time in bloom. The double sort is one of the finest herbaceous plants recently introduced, and ought to be in every flower garden. The catalogues mention two other varieties which we have not seen, called *Smouthii* and *insignis*: the former is described as being of "a bright rose crimson."

P. albiflora is the most elegant of all the herbaceous Peonies, and is fairly entitled to redeem the genus from any imputation of vulgarity. The varieties are very numerous and so diversified in form that we sometimes wonder that botanists, addicted to niceties, have not formed them into separate species. The single white variety, which is assumed as the normal type of the species, is, when well grown, an extremely beautiful plant. Its dark and polished foliage, and its cream-coloured flowers, shaped like small goblets, with petals thick and of perfect outline, impart to it an elegance which is universally attractive. The older Chinese varieties, *P. albiflora* *Whitleii*, *Humea*, *fragens*, and *Revesii*, are all valuable plants for

the mixed flower garden. Our special favourite, however, is *P. albiflora* Potsii, which we regard as, upon the whole, the finest hardy herbaceous plant that grows. It is taller and harder than the single white, the leaves are of a dark purplish brown, the semi-double flowers are of a deep rich glazed crimson of an intense tint, and the anthers which, suspended on long thread-like stamens, project a little beyond the cup of the flower, are of a fine golden orange. The harmony of colour in the whole plant is exquisite. Besides the above, some 35 to 40 other varieties are enumerated in the catalogues of Messrs Wood of Maresfield, and of Mr John Salter of Versailles Nursery, Hammersmith, very few of which varieties, we are sorry to say, have as yet reached Scotland. Mr Salter, whose "specialité" is Chinese Chrysanthemums, and who has collected besides a great number of continental varieties of all kinds, obtained two gold medals for Peonies of this class, at the great metropolitan flower shows last summer. His flowers attracted universal attention. The following were the sorts most admired: we take the names and brief descriptions from the catalogue of Mr Salter:—

P. Albiflora.

- Amabilis grandiflora*, sulphur white shaded rose.
- Anemoneflora striata*, bluish yellow.
- Buckii*, rose purple.
- Elegans superbissima*, rosy bluish and salmon centre.
- Grandiflora nivea plena*, delicate lemon bluish.
- Humea alba*, cream and rose.
- Papaveriflora*, bluish and rose.
- Prolifera tricolor*, white and lemon centre.
- Queen Victoria*, delicate bluish and lemon centre.
- Reine des Francais*, white and rose lilac.
- Reine Hortense*, rose, centre white.
- Victorie Modeste*, lilac bluish.
- Virginalis*, white.

For a fuller list we must refer to Mr Salter's interesting catalogue, in which our readers will find many other fine things. It will be observed that many of the above are of light delicate colours; but besides Potsii already mentioned, there are several of deeper tints, which would afford means of good contrasts. In gardens where there is abundance of room, we would strongly deprecate the arranging of these Peonies in beds or masses. We would put them in conspicuous positions in mixed flower borders, either singly, or in groups of threes of contrasted colours. According to our experience, they flourish best in a light rich soil formed from decomposed turf. Our finest plant of Potsii, and it has been truly magnificent, grows in a border where the above mentioned soil has an admixture of peaty earth and vegetable mould. They do not thrive well in exhausted garden soil, such as is frequently met with in flower borders. In hot irony gravel, or mould chiefly composed of it, they will not flower at all. Some of the varieties are probably a little tender. The old *Humea* occasionally fails to flower with us in cold seasons. The flower stalks should be

carefully and gracefully staked, before their own weight or the summer rains have brought them to the ground; at the same time, the stalks without flower buds should be cut away, and the superabundant foliage thinned out. When the plant is left in a littersy prostrate state, many of the flower buds will never open. As there is a tendency in the stalks to multiply at the crown of the roots, and so to spindle and become barren, we would recommend that the plants should be divided every five or six years. The strongest roots with two or three eyes attached should be replanted at once; and the weaker tubers may be put in rows in the reserve ground, where after a season or two they will supply neat plants for further decoration.

Pæonia Moutan,—The Chinese Tree-Peony is without doubt, the noblest of its family. Whether we consider the gorgeousness of the flowers, the curious form and tint of the foliage, and the foreign air of its whole appearance, we must allow it to be a shrub altogether unique. It is extremely popular in China, and grafted on the root of *P. albiflora*, it is grown at Canton very much as we grow potted Oriental Hyacinths in this country. There are many fine varieties, which however are still in few hands. Nine sorts are described by Mr Sabine in the "Horticultural Transactions" vol. vi. Since then Mr Fortune sent home from China some six or eight new kinds, and those that have proved distinct are described in the Journal of the Horticultural Society. Mr Fortune's plants have recently passed into the hands of Nurserymen, and may be expected to be purchasable ere long. The Catalogue of Messrs Wood of Maresfield, exhibits 15 varieties at very reasonable prices. Some other names also occur in Loudon's *Hortus Britannicus*. We cannot venture to harmonise these lists. We regret to say that we have seen only three distinct varieties in Scotland. Not long ago we found only two sorts in the principal nurseries at Edinburgh. Surely this is not as it should be.

Very incorrect notions are afloat relative to the tenderness of the *Moutan*. It was generally grown in conservatories and pits constructed for the purpose; and it seems difficult to dispossess gardeners of the idea that it is a tender plant. It has stood some winters with us without protection of any kind; and indeed it would require none, except for its flower buds, which pushing early are apt to be nipped by the vernal frosts. A slight hood of Spruce Fir branches is all that is necessary. With this protection we have seen it flourish on a lawn 500 feet above the level of the sea: at such elevations, however, and we suppose generally in Scotland, it is benefited by exposure to the full rays of the summer's sun in order to mature the flower buds. We have had no difficulty in multiplying it by layers, which if they do not root the first year, invariably do so the second. It is also said to be propagated readily by cuttings. The Chinese method of grafting to which we have alluded above, is described in recent books on gardening; but we do not

know how far it has been practised in this country. It is this:—take a tuber of *P. albiflora* or other herbaceous species; deprive it of its eye; cut in its side an angular notch about two inches in length, and fit into it a shoot from the Moutan, tie and pot it, and bring it on, at the proper season, by slight bottom heat in a hot-bed. This operation we are told may be performed any time during winter. It only remains to be added that *P. moutan* makes a fine lawn plant; and it is well adapted as a shrub for the mixed flower garden; but it should be planted singly, as it does not mass well.

S.

ANNUALS—THEIR CULTURE, ELIGIBILITIES, &c., &c.

BY MR R. ERRINGTON, OULTON PARK, TARPORLEY.

It is scarcely more than forty years since Annuals constituted one of the chief features in the garniture of our ornamental grounds; now they occupy a very subordinate position. As, however, many of them were very tender and fragile, their culture extended much more generally in the southern part of Britain than in the north. As to their present position, there have been many attempts to revive them, but they still remain somewhat in the rear of our half-hardy or bedding flowers. One thing however, is likely to accomplish a revival—what is termed the ribbon system of flower gardening. For this many of them are eminently adapted, and their merits being recognized in this way, an extension of their culture generally may be the result. That they impart an airy kind of elegance to borders and beds where properly cultivated, there can be no doubt; and in this respect they are very different in figure from many of our bedding flowers as they are called, which for the most part are somewhat heavy in outline. But they have other and valuable properties which I must beg to point out. They are eminently adapted to form part of a regular reserve garden, to fill up those blanks which successively occur in all situations during the summer months. As to their associations in our minds, why, who does not look back with pleasure to the neat little patches of Virginian Stocks, Venus Looking-Glass, Larkspurs, or even the melancholy-looking Love-Lies-Bleeding, &c., that used to greet our eyes in the neatly-trimmed border, when the world seemed fresh and new to us? But people complain much as to their evanescent and fragile propensities, and certainly not without reason. This has been traceable in no small degree to neglect in their culture. Like everything else in gardening they require attention, which of course involves a little labour, and this at particular periods. The accusations against them may be thus made out. They are apt to produce too much foliage; they grow straggling; in bad summers they are weedy looking, and they

require much trimming and dressing. Now most of these mishaps, admitting them to have much truth, arise, as before stated, from bad culture. Here let me point to one other charge which may in perfect justice be attached to them. They are very liable to the depredations of snails and slugs. This is indeed a heavy charge, and apparently a great drawback to their culture as concerns amateurs and little gardeners; and this brings me to one particular point of advice I have to offer, and which is to raise them all in pots. About half a dozen years since, I felt tempted to have most of the new Annuals of any value in cultivation, and having some long borders in the kitchen garden, which although in the main, devoted to fruit culture, would also open the margins to flowers, I sowed the Annuals in patches, from end to end. They came up tolerably well, and with their hard sounding names, seemed to promise great things. But, alas for the fond hopes of enthusiastic gardeners! not one in a dozen of these groups remained to produce any effect. The snails and slugs devoured them in such an insidious way, that they might be said to vanish rather than to be devoured. Henceforth I made up my mind that a few good pots of annuals, well looked after, and under the eye, were worth half-a-hundred of these glorious uncertainties.

But Annuals may be mismanaged even in pots. In the first place, people should be careful not to use stimulating soils. It is not the young plant in its earlier stages that requires stimulating, but when just attaining a blossoming condition. I use and also recommend a sound maiden loam alone, of about a year old; this will produce a sturdy plant. For pots, those of about five inches will be found best in the end; I have used three-inch pots, but the plants cannot go through much "wear and tear" in these; and the business is with a great part of the stock to keep it in reserve.

Some little care and skill are also requisite to sow thickly or thinly in proportion to their habits of growth—as a general maxim, they should be sown thinly. But there exists such a difference in habit, as well as in the requirements of the cultivator, that sowing, thinning out, &c., must at all times be modified by the circumstances of the case. Annuals thus raised in pots may with facility be defended against the ravages of snails and slugs, by being placed on a bed of cinder ashes in any half shady situation; or they may, if convenient, be reared in the greenhouse—taking care to get them out to harden before they become what gardeners term "drawn."

Thinning out is a most important proceeding; and if they become too thick must be performed betimes. Many of the kinds would be all the better if only four or five were highly cultivated in a patch; indeed, there could be such a thing as making a high display with a single plant. As a general maxim, however, and for those who do not understand principles in horticulture, let us say that no two plants should touch until they first show blossoms.

There is yet another consideration connected with pot culture which I must beg to point to before I conclude these observations. It is well known that many kinds were too rambling in habit for express purposes, although possessed of much beauty of blossom. Now such may be rendered much more compact by being kept in their pots until they show blossom, and then planted out. In this manner neat edgings or ribbons may be formed by such things as *Chryseis*, *Nolana*, *Petunia*, *Mignonette*, &c. Indeed, almost anything may be done in this way, by a skilful consideration of the habits of the respective kinds. It must here be remembered by those who would fairly enter into the spirit of this question about Annuals, that no class of plants differ much more in habit than this. Some are towering and majestic, others make almost little bushes; some are sprawling or rather prostrate, in the language of botanists; some may be called rambling, others form little tufts or patches; and finally, others will run up poles or stakes according to will. But even these characters do not by any means enumerate all their habits; it would require a book to handle their characters and aptitudes fairly. And books have been written on them, but for my part, I have never seen one that has done justice to Annuals as a section of our floral decorations. Some flatter and gloss over their subject; others fall short in setting forth their real characters; however, the first make most agreeable railway companions, being lively in "prittle-prattle," and as for the second, why, like many other pen-and-ink affairs, they make excellent butter paper when their hour arrives.

But to return from this digression—how are Annuals to be staked when they require it? This is one point which must receive a little consideration. It must be confessed that they are somewhat awkward to handle in this way; for they submit with much reluctance to the starchy handling of the mere florist; his staking robs them of their elegance. Now, one part of my design as to the pot system, although a subsidiary part, is to supersede, as far as possible, the necessity for much of this same staking. When Annuals are thinned out betimes, they will require little staking in comparison of those which have grown in a neglected way, and, probably, in rich soils, until they are a mass of confusion. All that can be said on this head at present is, let the staking of whatever kind, be as light and airy as possible; let not the scaffolding prove of more importance than the building. I have found the light spray of Spruce Firs of much use in this way; the mere trimmings of that half-decayed spray which bends before the woodman's bill-hook. This, when all the foliage is off, is of very great use amongst Annuals, and is of the exact colour to be inconspicuous. If painted sticks are used, let me here advise that they be by no means of a green colour—they are too attractive even in that sober colour. A deep drab or heavy stone colour, almost approaching bronze,

will be found highly satisfactory, and, of course, the workman will conceal his stakes as he best can, remembering that they are but means to an end.

As our catalogues now-a-days are so full of fine names that those inexperienced in gardening feel sorely puzzled how to select, I will append a list of what I consider the most *useful* Annuals at the present time. Let it be understood, however, that the list is given quite irrespective of their novelty.

HARDY ANNUALS.

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|----------------------------|-----------------|-------------------------|
| 1. Alyssum maritimum. | 10. Chryseis | 21. Malope |
| 2. Cistus guttatus | 11. Gilias | 22. Nemophila |
| 3. Anagallis | 12. Godetias | 23. Nolana |
| 4. Calliopsis or Coreopsis | 13. Gypsophila | 24. Oxalis rosea |
| 5. Calandrinias | 14. Iberis | 25. Sweet Pease |
| 6. Centranthus | 15. Kaulfussia | 26. Platystemon |
| 7. Clarkias | 16. Larkspur | 27. Saponaria calabrica |
| 8. Collinsias | 17. Leptosiphon | 28. Schizanthus |
| 9. Convolvulus | 18. Limnanthes | 29. Viscaria |
| | 19. Linaria | 30. Xeranthemum |
| | 20. Lupinus | |

TENDER ANNUALS.

- | | | |
|-----------------------|--------------------|-------------------|
| 31. Abronia umbellata | 36. Portulaca | 41. Asters |
| 32. Clintonia | 37. Rhodanthe | 42. Zinnias |
| 33. Lobelia | 38. Scyphanthus | 43. Humea elegans |
| 34. Mesembryanthemum | 39. Sedum cœruleum | 44. Tropæolums |
| 35. Phlox Drummondii | 40. Stocks | |

Of these, Nos. 1, 2, 3, 5, 10, 13, 15, 17, 22, 23, 24, 27, are dwarf, and adapted for edging and margins, or for the outside row in the ribbon system.

Nos. 4, 7, 9, 12, 20, 21, 25, 28, 30, are of high growth, and too heavy in character for situations requiring elegant and airy forms, with gaiety of colouring. They are, however, very important to combine in other mixed flower borders, or to fight it out with shrubs; and, indeed, for other purposes. In the list of names given above, the generic name alone in most cases is given; there are species and numerous varieties with popular names in many of the families, but of this most of the readers of the *Scottish Gardener* will be fully aware. To have given the whole would have occupied too much space. One thing I may name; many of the kinds may be purchased in mixture as being more economical and as meeting every requirement. Nos. 3, 4, 5, 9, 12, 22, 23, are eminently adapted to this end, being of similar habits. I last year made a long edging at the back of the borders, accompanying a fancy promenade by drawing a drill as for Parsley, and sowing all the dwarf kinds thoroughly mixed together, and a little Mignonette amongst them. This pell-mell edging was admired by every one, and served much by contrast of form and general expression to set off the distinctness of the groups or lines on the side next the promenade.

CULTIVATION OF EPACRIS FOR EARLY WINTER FLOWERING.

ALL winter flowering plants, especially those that are of brilliant and striking colours, are prized; and to the amateur or gardener of only greenhouse and pit accommodation, few plants contribute so much to cheer and enliven the winter months, as many of the varieties of *Epacris*, when judiciously managed. Generally speaking, they are not commonly seen in bloom much before February or the early part of March, and frequently still later. That they are always beautiful, needs not to be told here; but when flowered in December, they are not only more acceptable than in spring, because flowers are generally more scarce, but they last a much longer time in their prime. They can easily be had in bloom by the early part of December, by the mode of culture which I will now proceed to detail.

I will not go back so far as to treat of the propagation of this plant; such is not, or at least should not be, the business of the gardener; but I will suppose that the necessary stock of young plants in 4 or 6-inch pots has been got in from the nurseryman—these, if strong and in thorough good health, will consist of a pot full of roots, several strong and longish shoots, with a quantity of shorter ones “nearer home,” as the saying is. First of all take your knife and cut all these shoots back, leaving only two or three inches of the previous season’s growth. Examine the drainage and see that it is in good order, and then place them in the warmest corner of the greenhouse; here let them remain till you see them breaking at every eye or bud; then remove them to a temperature of from 55° to 60° at night. If your means will not afford you such a degree of heat, place them in a compartment of a pit where you can take every opportunity of shutting up with sun heat early in the afternoon; however, if a little fire heat and a moist atmosphere can be afforded them, all the better. Here they will soon begin to put forth a host of young growths, and when they have grown an inch or two should be shifted into pots a size or two larger, using for soil fibry peat, with say, a fourth part of silver sand. The peat should not be sifted, but simply broken up with the hand or chopped with a spade. Make sure of a thorough drainage, and pot moderately firm, sprinkling half a handful of silver sand on the surface of the soil to keep the top part of the ball from becoming hard and livery from watering and syringing. When potted remove them to the same quarters, as they will now make rapid progress and make strong fresh like growths, which will not bear a scorching sun with impunity. They must be shaded in the middle of the day; keep them near the glass; admit air rather freely on fine days, and ply them with the syringe morning and afternoon at shutting up time.

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By the middle of June they will have made growths, eight inches or more in length, and have made themselves at home in their enlarged pot. They must now be gradually subjected to more light, air, and less atmospheric moisture and artificial heat, and step by step well hardened off, till placed in the full sun outdoors, in some sheltered situation, and in order that the sun may not injuriously affect their roots, let the pots be shaded; a good way of effecting this is to place them inside another larger pot. Carefully attend to them with water throughout the latter part of summer and early autumn. If the pots are properly drained, there is more danger from neglect of a due supply than otherwise. They will in this position soon begin to look rather sun-burnt, but never mind that. You will have the pleasure at housing time to see a sturdy plant with a firm well-matured growth, well set with bloom buds and before Christmas, and from that time till far on in February you will have a far better display of bloom than if allowed to make their growth at a later season, when, as has been already observed, you would have to wait till spring before they flowered, and their attraction is then somewhat lessened by the many other gay things which bloom in spring.

The following season treat them in the same manner; only, if large plants are not an immediate object, and smaller plants befit your accommodation best, they need not be shifted. When growing, they may be stimulated with occasional waterings of weak, clear, liquid manure. Minus the shift, they will make more compact plants; but when required for cutting, it is sometimes desirable to have long and strong spikes of flower, and with an annual shift—up to a certain point—this is best attained.

By pruning back the plants annually, after they have done flowering, they are kept in proper shape, and never become the bare long-legged things yet too frequently met with.

For early flowering in this way, I grow the following sorts principally, and which I have found the earliest:—

Hyacinthiflora.
... *candidissima.*
Impressa alba.
Nivalis.

Impressa.
Fulgens.
Splendens.
Wilmoreana.

DRAIBHAIDH.

THE HOLLYHOCK.

BY MR W. PAUL, OF THE CHESHUNT NURSERIES, HERTS.

If I had not proved by experience the genuine character of Scottish hospitality, I might pause before crossing the Tweed, even to advocate the claims of a favourite flower. But, if not a Scot, I am the son of a Scot, and feel an increasing interest in the movements

continually taking place in the "land of my fathers." Permit me then to contribute my mite towards your excellent periodical, in the shape of a pleasant talk on a flower so admirably suited to the gardens of your northern climate.

The Hollyhock, although one of our oldest garden favourites, has but recently taken that development which justly places it in the first rank of hardy autumnal flowers. Bright indeed is the many-favoured throng, struggling for position at the Court of Flora; and in such a contest, to have recently "risen from the ranks," is not the surest passport to patronage and fame. Not many years ago the Hollyhock was a common plant; the seeds were sown at mid-summer in company with Wallflowers, Sweet Williams, &c.; the young plants were transplanted in autumn or spring, bloomed in the summer or autumn following, the seeds gathered, and the plants' future left to the chances of fate. Thus every year a fresh stock was raised from seed; if any variety showed symptoms of improvement, no means were taken *as the rule* to secure its perpetuity. The Hollyhock was a showy, but a coarse and common plant, not worthy of this distinction, and good, bad, and mediocre were left to perish in one common indifference.

Perhaps no one in England did more than the late Mr Charles Baron to raise the Hollyhock to its present high position. He sowed the seeds, and watched the young plants till the period of flowering; if any one appeared of more than ordinary beauty, the kind was perpetuated by dividing the roots. From these seeds were saved, and thus a new starting point was from time to time obtained. Other cultivators have since followed out the same course, and the result of progressive culture is an improvement in every way satisfactory. Originally the flowers were ragged, flat, flimsy, drooping from weakness in the flower stalk, the flowers standing at long intervals on the stem, often washy and undecided in colour—it was in every sense a plebeian flower. Now we have smoothness, the ball presenting to the eye a beautiful half globe, placed on a broad, flat, and substantial base—the flower-stalks short and strong, the flowers so closely set on the stem as to form, when expanded, a long unbroken column of colour. White, rose, red, black, yellow, are here in their brightest and most varied hues. What, indeed, can be more beautiful, in the season when most lovers of flowers are spending their leisure at their country residences, than groups of Hollyhocks judiciously gathered together, or dispersed throughout the flower-garden and shrubbery, shooting up their broad massive spikes of colour to the height of eight, ten, or even twelve feet! How they relieve the flatness of an ordinary garden! What a brilliancy they impart, if haply surrounded with trees and shrubs dressed in Nature's more common and sober livery—green! Although our flower cannot claim a long line of noble ancestry, merit has now obtained for it admission within the charmed circle where Flora's most favoured ones are proud to dwell.

Having thus briefly traced the development of the Hollyhock, let me proceed to offer a few remarks on cultivation. And first of plants struck from cuttings, as it is by this means the best kinds are usually propagated. There is a general opinion that Hollyhocks are difficult to grow and propagate, and this perhaps has prevented many from entering on their cultivation. We cannot say, however, that we have found any difficulty that has not given way before a little experience. Certainly it cannot be multiplied, *ad libitum*, as the Dahlia and some other plants may be; but a fair and sufficient increase may be obtained if a rational mode of cultivation be adopted. At the time the main spikes are in flower, there are usually side-spikes springing from the base, and these are available for increase. Let the wood become tolerably firm, then cut the shoot off close to the base, making a cutting of every *perfect* eye (some eyes are blind, and these, though emitting roots, seldom form plants); place them under hand-glasses, or even in the open ground in an east border, shading very lightly, and never before eight o'clock in the morning. Here they will root in a few weeks, and may then be taken up, potted in small pots, and stowed away in a dry cold frame for protection during winter. The less artificial heat employed the better; to the driving and coddling employed in various stages through greed of gain, we attribute in great measure the kind of murrain which, though now happily passed away, has carried off the choicest and best of many superb collections.* These young plants having wintered and being hardened, may be turned into the open ground in April, placing an inverted flower-pot over them by night till all risk of severe frost is past. The tops will at first make but little progress, but, what is more important, the roots commence working at once. Before the roots extend too much, a neat stake should be driven down within a few inches of the plant; two feet above the ground is sufficient to hold the tallest spike, provided the stake be driven as far below ground. To this the flower-spike should be tied as it rises, and when the flowers expand, shading is necessary if required for exhibition. If not grown for exhibition, two or even three spikes may be allowed on a strong plant, and shading which is troublesome and unsightly may be dispensed with. When the flowers are over, and the seed ripened and gathered, it is well to cut off the spikes within a few inches of the ground, that the old roots may be taken up and planted in a cold frame for safety during winter. Where the soil is naturally dry, some plants might remain uninjured in the ground during winter, but this is a practice that cannot be recommended. The Hollyhock is not a long-lived plant, and the stock should be frequently renewed by propagation; the average may, we think, be

* In looking through some thousands of young plants wintered in cold frames in the nurseries here, we are happy in being able to report "no symptom of weakness or disease."

placed at five years, though recently few collections have attained this average.

But while the Hollyhock cannot be propagated to a large extent by cuttings, there is a method—by seed—by which any extent of stock may be raised. Secure in the first instance seed from the best sorts; sow in the open border at midsummer; transplant some showery time in September on a raised bed, where the plants will remain dry at root during winter; shade and water the first fortnight as may be required. About the month of April these plants may be again removed to the positions where intended to bloom. The colours of the flowers of seedlings are not always the same as those of the parent, therefore they cannot be depended on unless previously bloomed, where masses of separate colours are required. Among a quantity of seedlings some will come so near the parent as to require a good judge to detect the difference. Such, although usually inferior, have sometimes been sold for the true kind, and through this laxness we have not unfrequently known a good variety to be unjustly condemned. We do not say these seedlings are bad; indeed, for those who want a quantity of plants for common purposes of decoration they answer well enough; but they should be sold by the hundred at a cheap rate, and not as named varieties, for they are rarely equal in the eye of the connoisseur, especially if required for exhibition.

The Hollyhock, under all circumstances, delights in a rich loamy soil, and can scarcely receive too much water while growing and flowering.

I shall conclude this article by offering a list of a few of the best varieties. For 24 smooth, distinct, and finely formed flowers, suited for exhibition, I would recommend—

Queen of the Whites—pure white, the best of this colour.

Primrose Perfection—delicate primrose, perfect shape, and fine spike.

Empress—Orange buff, very good.

Queen of the Buffs—pale buff, one of the best.

Beauty of Walden—fine rosy pink.

Purpurea Elegans (Fellowes)—plum colour.

Solfaterre improved—fine pale yellow.

Beauty of Cheshunt—light rosy red, one of the best.

Lord Jocelyn—bright cherry colour, large and handsome.

Memnon—light crimson, very fine.

Rosy Morn—bright rose, very large and well proportioned.

Hon. Mrs Ashley—lilac peach, most excellent.

Miss Ashley—pale creamy fawn, smooth and distinct.

Mrs Oakes—delicate shaded salmon.

Purple Perfection—light purple, distinct and good.

Pearl (Paul's)—flesh white, surface large, smooth, and glossy.

Lizzy improved—clear peach colour.

Eva—pale peach.

Miss Nightingale—primrose good.

White Globe—white, large, close, and excellent.

Village Maid—crimsoned peach.

Lilac Model—blush shaded with lilac.

Lemonade improved—canary, purple base.

Beauty of Beechwood—rosy crimson, form and spike good.

For 48 less costly kinds, suitable for massing and all ordinary purposes of decoration, the following may be planted, and it will be observed this list includes some of the former—

WHITE.—Avalanche, White Globe, Snowball.

BLUSH, FLESH, &C.—Blushing Bride, Pearl (Paul), Leda, Louis Napoleon, Princess Alice.

PEACH.—Emily, Eva, Hon. Mrs Ashley, Lizzy.

ROSE AND PINK.—Duchess of Sutherland, Emperor, Enchantress, King of Roses, Rosy Morn, Souvenir, Unique.

CRIMSON, &C.—Beauty of Beechwood, Beauty of Cheshunt, Fireball superb, Comet, Glory, Lord Jocelyn, Memnon, Scarlet King, Trafalgar.

PURPLE, MAROON, AND BLACK.—Black Prince improved, Cato, Pourpre de Tyre, Purple Perfection.

PRIMROSE AND YELLOW.—Argo (Paul's), King of Yellows, Lemonade improved, Ophir, Solfaterre, Sulphur Queen, Sulphurea perfecta, Triumphans, Yellow Model.

FAWN, SALMON, ORANGE, &C.—Agricola, Charles Baron improved, Darius, Eugenia, Julia, Miss Ashley, Ophirie.

CULTIVATION OF THE PHALÆNOPSIS.

BY MR A. CRAMB, TORTWORTH COURT, GLOUCESTERSHIRE.

Were we to search assiduously, it is scarcely possible to select a genus more deserving of attention than the *Phalænopsis*, and it well merits all the praise that has been bestowed upon it. The genus is a small one, containing only three distinct species, namely, *amabilis*, *grandiflora*, and *rosea*. The latter, however beautiful, is the least interesting of the three, and I presume is scarce, as it is seldom met with unless in extensive collections.

Propagation is attended with so much difficulty, that the supply of young plants, to a very great extent, depends upon importation, and while such is the case, will always secure a high price in the market. When off-sets are produced, they should not be separated from the parent plant till well rooted. Mr B. S. Williams, late gardener to C. B. Warner, Esq. of Hoddesdon, informed me that he once had a plant produced from the top of the flower spike of *amabilis*, but such an occurrence is a rare one, and by no means to be depended upon. There can be no doubt that there exists a distinct variety of *amabilis*, possessing larger foliage, and a more robust habit than the original species, although, so far as I am

aware of, not recognised by cultivators. We grow both varieties, and hence I speak with more confidence. The leaves measure 5 inches in diameter, and the flower spike, when about 15 inches high, ramifies into several distinct divisions, and when the flowers are fully expanded, produce a gorgeous appearance, but in point of colour possess no material difference.

For some years I grew our *Phalænopsis* on pieces of wood, covered with sphagnum, but under this treatment their progress never gave me satisfaction. The centre of the plant apparently was too confined, and the young leaves pushed with difficulty. Mentioning this circumstance to a friend, very learned in all pertaining to orchid cultivation, he at once pronounced the case to be one of poverty at the roots, and strongly recommended their removal to baskets, and placed among fibrous peat and sphagnum. I at once acted on this advice, and within six weeks, so great was the improvement, that it would be difficult to pronounce them to be the same plants, unless previously acquainted with the fact. From this case, I am more than convinced that block cultivation is by no means the best system, and I will by no means return to it again. The collar of the plant should rest 3 or 4 inches above the surface of the basket, for unless this is attended to, fatal effects may occur, such as gangrene by an excess of water.

As the *Phalænopsis* comes from Manilla and Java, the heat necessary is that of the East India house, which ought to range during the growing season from 75° to 80° , and may rise as high as 90° , provided an abundance of vapour is kept up, not by syringing the plants, but by pouring water over the paths and hot water pipes.

Few things are more conducive to the health of the *Phalænopsis* than sponging their leaves three or four times a week with clear soft water, as dust lodges readily on their broad leaves. Like the *Ærides*, the *Phalænopsis* requires but little rest, and flowers almost at any period during the year. There is one peculiarity, namely, that when the flowers are cut, if not below the middle of the spike, it will push a fresh shoot, and flower a second time, and this process may be carried on successively, till the plant is destroyed or very much weakened.

ON SUPPLYING MOISTURE IN FORCING HOUSES.

BY MR THOMSON, DALKEITH GARDENS, DALKEITH.

It is a matter perfectly recognised by all gardeners that unless some means can be adopted for supplying atmospheric moisture to forcing houses, evil results to vegetation ensue. I have seen many plans resorted to, but have always considered them more or less objectionable. The application of cold water to the pipes by the watering pot or syringe, gives a glut of steam for the moment, but

it soon gets condensed, and vegetation suffers more from succeeding aridity than it would have done without such a bath; tanks on the pipes have their advocates, but they get dry, and stand so at intervals, under even good general management; capillary attraction is resorted to, but the cloth soon rots, and is at all times unsightly; a tube with holes in it, run along the pipes, pours cold water on them, reducing their heating power, till such small holes get corroded up. The subjoined sketch will at once explain itself, and



it will be easily perceived that it is liable to none of the above objections. It consists of a common 4-inch iron gutter, run along over the top pipe, and must be fixed perfectly level. From the connection, A, a stream of hot water, on its way from the boiler, rises to B, and flows along to C, giving off an abundant and regular supply of moisture, as well as heat, during its progress; by exposure to the colder air in the house it loses its heat, and becomes of greater specific gravity than that in the pipes, and hence its rapid descent into the return pipe at D, and thence to the boiler again. One peculiar excellence of this plan is, that in proportion to the heat of the pipes, will be the supply of vapour given off by the water in the gutter. One thing must be specially attended to, and that is, that the supply cistern of the boiler must have the water kept in it to the exact level of the gutter; this is best effected by having a ball-cock in the cistern. If this is not attended to, the water will either flow over the gutter, or the opposite evil will occur. I have adapted this plan to the pipes of two vineries where Grapes in pots are growing, and I never saw anything that more completely answered the end in view, and I mean to extend it to all our forcing houses. Another benefit resulting from this plan is, that it adds greatly to the heating power within the house, for I consider that a 4-inch open gutter so fixed, and kept full of hot water, gives off as much heat into the house as a 4-inch pipe does, while its cost is only one-half that of a 4-inch pipe.

THE TREATMENT OF ACROPHYLLUM VENOSUM.

BY MR W. CARMICHAEL, DUNMORE PARK, FALKIRK.

The *Acrophyllum Venosum* is seldom seen in first-rate condition, although one of the most telling plants in a collection, when well done, and has few equals as a greenhouse plant—remaining a long time in flower.

The following is the method by which I have been thoroughly successful in growing and exhibiting it. A young plant being obtained from the nursery—one on a single stem I prefer—being well started, I at once shift it, the compost used being peat and sand, three parts of the former to one of the latter, with about a sixth part of broken flints, which are much preferable to broken potsherds where they can be obtained. In summer, the roots delight to perforate amongst them, being cool, and in winter the water passes off freely from them. The peat must be in a dry, healthy state before using it, having it broken up, with a stick used for the purpose, on the potting bench, and sifting it through a one-inch sieve; what the sieve retains is placed over the crocks as a sub-drainage, over which I scatter a handful of broken flints, so that no stagnant water can possibly remain at the roots. After the flowers begin to fade, I cut them all off, generally at the first joint below the flower spike, which causes the plant to break regularly all over. I then place the plant in a pit or warm part of the greenhouse for a few weeks, to start it into growth, and shade during the middle of the day until the young shoots get a little matured, afterwards to be fully exposed to sun and air, and merely protected from the frost in winter. With exactly the above treatment, I had the honour of exhibiting one of the finest specimens of the *Acrophylum Venosum* in the kingdom, the plant being in a 20-inch pot, and about 3 feet through when exhibited. The plant was about seven years under my care previously.

BARBAROSSA GRAPE.

BY MR D. THOMSON, DYRHAM PARK, HERTS.

Being about to plant a vinery this spring, and having intended to plant a Vine or two of this variety, I must confess the “hole” that Mr Cramb of Tortworth Court picked in its coat, in your January number, rather made me consider the propriety of so doing, having no house-room to spare for experiment in the way of Vines. It seems to be quite incorrigible with Mr C., as he pithily states that all his “expectations have been pulverized.” I am very much pleased to see the candid out-spoken way in which he has expressed his opinion of this Vine; and, depend upon it, it must be by the expression of practical results that the merits of various fruits and flowers are to be got at—by the united testimony of cultivators. But, however, with regard to this Grape, Mr C.’s experience as to its being so shy a fruiter, is not borne out by others. An instance came within my notice yesterday (Feb. 13), which would just prove the very reverse. I visited a large forcing garden where a good many bunches of this Grape were still hanging in a span-roofed house, entirely devoted to itself. It was not well coloured, but the gardener accounted for that, from the fact that he had over-cropped the Vines, and declared it to be a *most abundant* fruiter, both in

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the number and size of the bunches ; but the flavour is certainly very inferior, and in comparison with an adjoining house of Muscats of Alexandria, the Barbarossa was considered, and justly so, I think, in every point not worth growing. But this conclusion was by no means arrived at on account of its being anything like a shy fruiter, but solely on account of the inferior flavour. In this instance, I could not learn that there was anything peculiar in the treatment.

I send you these remarks simply to show how different are the experiences of two first-rate gardeners, and that Mr Cramb's experience is not to be taken as universally applicable in this case, although I thank him heartily for his statement.

NEW DAHLIAS FOR 1857.

In answer to your Correspondent, "A Dahlia Fancier," I trust the following short remarks will not be out of place regarding the new Dahlias generally, from Notes I took when I saw them growing and exhibited in and around London last autumn.

Lady Popham (Turner's)—White, beautifully tipped with lavender, of the finest form, well up in the centre ; a great acquisition in its class.

Midnight (Fellowes)—Dark shaded maroon, of first-rate form, and immense depth of petal, and to all appearance very constant.

Marion (Fellowes)—Light rosy buff, slightly tipped ; of fine size and first-rate form.

Royal Scarlet (Keynes)—Scarlet, tinged with crimson. This is a noble flower in every respect ; very high built, centre well up, and petals of the finest form. Will be an acquisition in any collection for years to come.

Touchstone (Fellowes)—Light rosy purple ; a flower much in the way of Mr Seldon, with a broad and finer petal.

Cherub (Holmes)—Light orange yellow ; a fine, high-built flower, good form, something new in colour, and very attractive.

Dr Gully (Fellowes)—Yellowish buff, tipped with cherry ; pretty taking colour ; well up, but defective on account of the petals being rather long.

Duke of Devonshire (Dodds)—Colour, shaded rosy lilac, arrangement and outline of the petals first-rate ; above the average size.

Mrs Edwards (Summers)—Of exquisite form, having all the properties of a first-rate flower ; colour delicate rosy lilac.

Duchess of Beaufort (Bush)—Colour, blush tipped with purple ; fine outline ; petals beautifully cupped ; to all appearance very constant.

Mrs Critchell (Rawlings)—Colour, light buff ; of fair average form, but rather small.

FANCY VARIETIES.

Charles Perry (Keynes)—Reddish rose, striped with crimson ; fine compact centre ; first-rate as a Fancy. This flower has also

been shown as a self, under the name of Charlie, in which state it comes much finer in form and arrangement.

Conqueror (Keynes)—Colour, bluish red, striped and spotted with light crimson; rather flat, but in all other respects very fine.

Carnation (Keynes)—Colour pure white, striped with purple; fine form; a beautiful variety for exhibition.

Margaret (Dodds)—Coppery yellow, striped with crimson; of exquisite form, but rather low in the centre.

West Coates Nursery, Edinburgh.

JOHN DOWNIE.

LONDON HORTICULTURAL SOCIETY'S FEBRUARY MEETING.

As a report of the productions exhibited on the 3d of February 1857 at the Horticultural Rooms, Regent Street, London, may be interesting to the readers of the *Scottish Gardener*, I have much pleasure in forwarding to you the particulars of what I heard and saw there. To a stranger to London it may be interesting to know that the Society's Rooms, 21, Regent Street, are close to the Regent Circus, Piccadilly. Ascending a short flight of steps from the entrance passage, and presenting my ticket of admission to a young man in what may be called the ante-chamber, who politely requested me to sign my name in a book, I entered the folding-doors of the Exhibition Room. The room is about 25 yards long by 15 wide, with a table in the centre, a raised platform for the chairman and lecturer on one side, with rows of benches one behind the other, forming the three parts of a circle from the platform around the centre table; there are several small side-tables in the room, and portraits on the walls. Over the head of the chairman is a full-length portrait of Sir Joseph Banks—opposite to that a portrait of Mr James Dickson, V.P., 1820; under him a small antique picture of King Charles II., with Mr Rose, the royal gardener, on one knee, presenting to his Majesty the first Pine Apple grown in England. In another part of the room is a portrait of Mr Robert Brown, the greatest botanist of modern times; of Andrew Knight, Esq., and other portraits which I could not recognise. But the proboscis of a fly magnified is the most curious picture imaginable; whether it was a green fly or any other of the many flies so destructive to vegetation, or why it received such a distinguished place, I cannot say. On a side table inside the door were laid six plants of Brussels Sprouts; why such specimens were exhibited I could not divine, until Dr Lindley, in his lecture, explained the mystery. On the next table was a collection of Camellia flowers from J. I. Blandy, Esq., Reading. Coniferæ from the Society's garden—some appeared as if they had not been watered for a month; and if they were hawked about in the street, I would be loath to buy them without turning them out of their pots to see that they had roots and were not branches stuck into the soil. Twelve Chinese Primroses from the same garden were very good, but I cannot say as much for the writing on the labels attached to them. But a rich specimen of orthography was affixed to a creeping plant with variegated leaves like the variegated mint, by, no doubt, one of the generally useful class of gardeners in the country. It was as follows:—"Verbenea veragate seedling from Melendys, very hardy; as not flowerd yet." On the same table was a nice dish of walnut leaved Potatoes, also Asparagus, Seakale, Rhubarb, and Mushrooms, from Arthur Pryor, Esq., Roehampton. A fine Black Prince Pine Apple, weight 6 lb. 10 oz., from Mr R. Jones, gardener to the Dowlais Iron Company. Mr Lewis Solomon, of Covent Garden, exhibited splendid examples of the Beurre Rance, Belle Auvvergne, Catillac, Bon Chretien, Saint Germain and Easter Beurre Pears, Canada and Colville Apples; and the following vegetables: Artichokes, French Beans, Asparagus, curled and Batavian Endives blanched. Muscat of Alexandria Grapes, from R. Sneyd, Esq., Kale Hall, Staffordshire; Black Prince, from Mr Smith, gardener, to A. H., Davenport, Esq., near Congle-

ton, Cheshire; and Muscats of Alexandria, Barbarossa, and White Tokay, from Mr Fleming, gardener to the Duke of Sutherland, Trentham. A smooth-leaved Cayenne Pine, from Mr Ingram, gardener to her Majesty at Frogmore, weighed 6 lb. 12 oz. Mr Tillyard, gardener to the Right Hon. C. Shaw Lefevre, Heckfield, exhibited Easter Beurre, Beurre Rance, Brown Beurre, Winter Nelis, Knight's Monarch, Geant Moreen, Ne Plus Meuris Pears, and Black Prince Grapes. A *Camellia reticulata* flore pleno, with one flower, was sent by Mr Standish, nurseryman, Bagshot. A collection of cut flowers from Mr H. Williams, gardener to A. Fairre, Esq., near Liverpool, comprised *Chorizema flava*, *Erica vernix*, *Epacris campanulata alba*, *Erica hyemalis*, *E. intermedia*, *Camellia elegans*, *Cœlogyna cristata*, *Diosma bucca*, *Mirbelia grandiflora*, *Azalea amana*, pretty bright purple, *Acacia platyphylla*, *Gesneria zibrina*, *Cleisostoma rosea*, a poor thing, *Lælia superbiens*, *Calanthe restita*, and *Camellias*. Some fine Hyacinths, from Mr Cutbush, nurseryman, Highgate, and a fine specimen—a magnificent bunch of ripe fruit of *Musa Cavendishii*—from Mr Young, gardener to W. Stone, Esq., Dulwich, and two fine tree-like Mignonette plants in full bloom from the gardens of the Horticultural Society.

At 2 o'clock the chairman, the Rev. Vernon Harcourt, opened the proceedings by stating that the resurrection of the Society is now beyond a doubt; it is like a phoenix rising from its ashes, and will take a higher flight than ever. He cautioned the Fellows who did not seem to know the nature of the ballot-box, the negative from the affirmative, the *yes* from the *no* side, and for elucidation, the ballot-box, like a large square carriage lamp, was produced by an attendant and carried round for the election of members. If some members of the Horticultural Society are liable to make mistakes, it does not augur much for the universal adoption of the ballot-box, but I suppose they understand such things better in France. Dr Lindley, who is an excellent lecturer, began by directing attention to the great box of Grapes exhibited by Mr Fleming, which, although the Barbarossa, were not large, they were altogether first-rate for the month of February. Allusion was then made to a dish of West St Peter's Grapes ripe in February, when, as he said, we were told that it was impossible to produce them before April. Attention was directed to the Black Prince Pines, which were not generally known but amongst gardeners. Fruit of *Musa Cavendishii* was seen in the room before, but such a fine fruit as the one exhibited to-day, weighing 16 lbs., all perfectly ripe, was never seen there before. The Dr, warming with his subject, passed a high eulogium on the native productions from Heckfield, and also the picked samples of foreign fruits and vegetables sent by Mr Solomon of Covent Garden, the Asparagus and Artichokes from Paris, and the fruits, most probably from the fine climate of Auvergne. A letter was read from Mr Judd on his practice adopted for 16 years of saving his own Brussels Sprouts seed, and the samples of such home saved seed were exhibited. Some details in the letter which I could not hear, elicited from the Dr in his running commentary the monosyllable "fudge." The next subject that the lecturer directed attention to was the double *Camellia reticulata* sent by Mr Standish. We all know what the old *Camellia reticulata* is, so large and open in the centre that a person could put his fist into it; but although the flower exhibited was small, being on a sidebranch of a small plant, he had no doubt but on a large tree they would be very large; it was sent to Mr Standish by Mr Fortune, who purchased it from a Chinaman, who brought it down to him from the interior of the country. The named collection of Hyacinths, from Mr Cutbush, would give intending purchasers the opportunity of selecting the colours and sorts that they should like. The *Lælia superbiens* was particularly noticed, as there are several varieties, but in this one the crimson centre and beautiful white waxy petals produced a strong contrast. The lecturer then wandered into an account of the perverted smell of Hottentots, who preferred unsavoury to what more polite society considered agreeable smells, such as assafoetida and the *Diosma bucca*, a small branch of which he exhibited. A small brown stick, about a yard long, was then produced and represented as a great curi-

osity, it was the stem of the rice paper plant—the rice paper of commerce—realising a revenue of 30,000 dollars; what was most singular in its growth was the fact of the pith increasing in size as the plant grew old. A knife was inserted in one end, and by twisting the stick in the hand, the lamina or flakes peeled off around to the bottom, which was then laid flat and pressed, and was then fit for use. It was brought home by Mr Fortune, who, as the Dr said, was then probably in the room, and in a flourishing state of health. The Dr then pointed to a drawing on the black board beside him, which, as well as I could see, represented a steam-engine puffing away on the top of a hill with pipes leading to a wood in the valley, he said it may be interesting and useful to country gentlemen to know that there was now a process, invented by M. Bouchiries, in actual operation, by which the most unprofitable timber could be made valuable; for instance, we all know that beechwood is not profitable, but by this process it becomes as valuable as oak, of which, he had no doubt. Something was said of the great value of vegetable respiration, of sawing the trunks across, of Stafford coals, of fluids finding their way into the cavities of timber, and of the difficulties of charging timber with fluids, but a board was exhibited charged with copper; or, whatever fluid was employed, blue veins were visible through the centre; it had been the portion of some wood that had been used on a French railway for 12 years. I hope it is not the yellow Moss Rose of a Frenchman. An hour was very agreeably spent in listening to the lecturer. About 35 gentlemen and 25 ladies were present. The prizes for the productions exhibited varied from 20s to 5s.

K. K., London.

ON THE CULTIVATION OF THE MUSHROOM.

BY WM. BAILLIE, HALE HALL GARDENS, LANCASHIRE.

ON perusing different periodicals connected with the gardening business, I find many a different method recommended for cultivating the Mushroom; some in-door culture, and some out-of-door culture. It is not my intention at present to condemn either of the systems; my object is rather to explain the method adopted here; my reason for doing so being simply that during the few years I have been connected with the gardening profession, I have seen many a different plan adopted, but none of them equal to that adopted here; which is out-door culture, both summer and winter. When I state that I write from practical experience, no one need for a moment doubt my statements. Some will consider that it is attended with a good deal of trouble, but anything that is worth having is worth trouble. Every gardener is aware that the Mushroom, in the months of December, January, and February, is very valuable; this is evident from the fact that 50 or 60 Button Mushrooms will draw in the market at this season of the year about five shillings. At this price who will venture to say that the method I am about to describe will not repay any one who will try it. I have shown our bed to several practical men, and they have all declared it to be the best they have seen. One day we gathered about a bushel, and in four days after, we gathered nearly two, and this all off one side, the other side being spawned (although spawned on the same day) with a different sort of spawn, and has turned out to be nearly a month later, but is now showing itself beautifully all over the bed; this is fortunate, for when the one side is nearly over, the other will be in its prime.

Many and various are the opinions expressed with regard to the materials or dung which is best adapted for a Mushroom bed. Some I have heard go so far as to say that clean horse droppings is best, and that nothing else will do; but this is nonsense, and I will prove it to be so, for I have seen a pretty fair crop of Mushrooms grown in a square box under a greenhouse stage, in nothing else but cow dung well trod. In the first place, I will mention the sort of dung we prefer, and the treatment it receives from us for a few weeks previous to its being put up into a bed. We go to the horse dunghill, throw

off all the littery dung until we come to that which is of a mouldy colour and not burning hot—this is all thrown out, at least as much as we think will be required for a bed. If convenient, we cart or wheel it into a shed where it can be kept dry; if not in a shed, it is thrown up into a heap at one end of the dunghill, and well covered up with long dung to prevent it from getting saturated with rain—but whether in a shed or out of doors, it is turned over every other day until it is quite short and cool. It has to be used in this manner sometimes three weeks before it is fit to be put up into a bed; it altogether depends on the state the dung is in when first thrown together, but it very seldom exceeds three weeks. If during this time it has been kept dry, it will now be nice, short, and cool, and may be built on the bed any time you may find convenient.

Our beds are 4 feet wide, about 15 yards long, and the same shape as a potato pit; to see it after it is soiled, no one would take it to be anything else. The foundation of the bed is made by laying a row of bricks all round the sides and ends, the centre is filled with branches or brushwood, similar to the manner in which some farmers lay the foundation for their hay stacks. On the top of this brushwood we put about one foot deep of long dung, then while one or two men are wheeling in the dung and emptying it alongside of the bed (which is in the kitchen garden), one man is building it on with his hands, another keeps treading it all the time. After it has got a certain height, the man that is treading it takes a four-pronged steel fork (and still standing on the bed) knocks it as solid as he can—for it is scarcely possible to make it too solid—at the same time bringing it to the proper angle or slope. When it comes to the top, it is about 6 inches wide; this being done, it is neatly knocked all over, raked up all round, and made tidy, a few watch pegs stuck into it and allowed to remain for a few days; the pegs are drawn out every day and felt with the hand until we consider it in a fit state for spawning. During this time it must not be allowed to get saturated with rain, it must be kept dry. If wet weather sets in before it is spawned and soiled, and you neglect covering it, you will meet with disappointment when you go to gather your Mushrooms. A few mats, old straw covers, or long dung will keep it quite secure.

Our bed was put up upon the 20th October; it was spawned and soiled on the 30th. The one side was spawned with spawn prepared in the following manner:—About the end of September we took a barrow-load of dung, the same as we use for making the bed, threw it on the bench in the potting shed; selected 50 or 60 5-inch pots, filled them half full of this dung, then put in two or three pieces of spawn, filled it to the brim with the same dung, and pressed it firm down with the hand. This being done, we removed them to a close pit, where the temperature might range from 40° to 50°, built the pots one above another in the corner of the pit, and covered them over with hay.

Two men spawned the bed; one raised the dung a little with his hands the other turned the spawn out of the pots, which was white all over, broke it up into eight or ten pieces, put a piece into the hole, gave it a knock or two with the hand—on to another hole, and very soon went over the whole bed.

Soiling it.—When soiling it we sometimes cart a load or two of soil, but not being convenient at this time, we cut out a trench, a spit deep, 18 inches wide, and two feet from the bed; the soil was turned over, made fine, and thrown over to the side of the bed, and all put on with the hand about 3 inches deep, and well pressed, sometimes knocking it a little with the back of the spade. This is all done in a much shorter time than many a one is aware of. It is a very good plan to lay a 3-inch tile round the outside before soiling, this gives you a good foundation for the soil. After it was soiled, it remained untouched until the 17th of November, when the weather was getting cold, it was then covered all over with dry useless hay from the top of a stack, and on the hay we put about 6 inches of long dung, and on the 8th of December we gathered about a bushel of Mushrooms, and have gathered once or twice a-week ever since, but only from the side which was

spawned from the pots, for it must be remarked that potting it makes it nearly six weeks earlier; the other side was spawned with common brick spawn. Any one erecting and treating a bed in the manner above described, shall, I venture to say, meet with the success he expects and deserves. If any of your correspondents can inform me of a simpler and more profitable method of growing Mushrooms, I shall feel extremely obliged to him for his trouble.

LESCHENAULTIA FORMOSA.

BY JOHN FLEMING, BLOOMHILL.

This is a lovely greenhouse shrub, but allowed to be a little difficult in its management; perhaps the absence of this plant in many greenhouses is owing to this.

The method I have practised with this little favourite I will sum up very briefly.

The best time I find for taking off the cuttings is in the month of March; using clean pots of any convenient size, filling them half-full of crocks, and placing over them a thin layer of Moss (*Hypnum*.) The better to prevent the soil searching through the drainage, the remaining half should be filled with peat, but the top half-inch with silver sand.

Before the cuttings are put in, I give the pot a gentle watering with a fine-rosed watering pot. The cuttings taken off are about $1\frac{1}{2}$ inch long, and their leaves trimmed up half-an-inch from the bottom, and the bottom of each cutting prepared with a sharp knife; they are then ready to be placed in the pot, giving them a slight watering overhead, so as to firm the sand close to the cuttings. The glasses are to be left off until they are quite dry.

When this is the case, the glasses may be put on, and the pots placed in a frame or pit where the bottom heat is mild, where they can be shaded from the sun, and not allowed to get dry. I find that the glasses are all the better to have a small air-hole at the top to prevent damp from gathering. The glasses should be wiped every morning. This is the great secret in striking such plants as this, and *Ericas*, &c., to keep the glasses as free from damp as possible.

When they commence to grow, the points ought to be pinched off; it enables them to root much sooner, and they send out side shoots at the surface of the pot, which forms the basis of future specimens.

When once they are properly rooted they are shifted into small pots 3 inches diameter, placing one plant in each pot; they are then placed in a cold frame plunged to the pot's edge in sawdust, shaded from the sun till they have once taken with the soil; the soil best suited to their growth is fibry peat and sand.

I had almost forgot to mention in passing that the sash placed over them should be kept perfectly water-tight, in order to prevent any damp or moisture from accumulating in the frame, as they are whimsical little things when in infancy. They should have plenty of air given them; when thus kept dry overhead they are not so liable to mildew.

As soon as the pots get full of roots they are shifted into larger pots, and the points of their shoots nipped off so as to make a dwarf nice plant of it. This pinching of the shoots must be frequently done, for without due attention being paid to this branch of culture, they would have a bad appearance, especially when allowed to get "lanky." They will have an inclination to flower when the plants are young. We consider such premature flowering injurious to their growth, and for this reason we pick off all the flowers as they appear, until they become of some size, so that they may with safety be allowed to carry a proper mass of bloom.

By the end of September they can be removed to the greenhouse, placing them as near to the glass as possible, there to stand all winter, when they are carefully noticed as regards watering, turning round the plants, &c. We do not supply them with this necessary element until they are actually in want

of it. When this takes place, the water given must be sufficient to moisten the whole ball. In the month of April, or as soon as the warm weather sets in, they are brought from the greenhouse to the cold frame, going through the same routine as formerly described for the previous season. When they have grown high enough to need supports, small stakes are applied, keeping the tallest shoots in the centre, coming gradually down to those in front, spreading them well out round the side of the pots. At the end of the season they are again removed to the greenhouse.

During the winter and spring months be on the look out for mildew. Apply sulphur on its first appearance; give air at every favourable opportunity; avoid cutting winds, and use scarcely any fire except in times of real necessity, guarding against damp as much as possible during winter.

If the above directions are attended to, I have no doubt all the expectations of the cultivators of this beautiful exotic will be fulfilled.

ERYTHRINA LAURIFOLIA

This beautiful plant we are informed was brought from South America in 1803. The flowers produced are of a dark crimson, Pea-shaped, and which are to be found growing on the upper part of the shoots; it is truly a beautiful object when good specimens are produced.

It is very seldom we get seed from this plant, so as to increase it by that means, especially in this country; however, it is in no way difficult to rear it by cuttings. The cuttings are best taken off when the plants are making their young wood, and from 3 to 4 inches long; they are removed close to the crown of the plant; it is then cut clean over at the lowest joint; this done, each cutting is inserted in a small pot, and that in a mixture of sand and leaf-mould. They are then placed in a pit or frame where the bottom heat is mild; if all has gone on well, young roots will be made in about a month, when they should be taken out and planted into pots a size larger. The soil we use for this tribe of plants consists of turfy-loam, sandy-peat, and rotten dung, equal parts; when once potted they are placed back into the frame or pit they came out of. As soon as these pots are full of roots, they are shifted into 6 or 7-inch pots. When once established in these pots, air is admitted more freely, so as to harden them before their removal to the greenhouse, and in this they are allowed to remain during summer. They should be frequently syringed to prevent red spider. At the end of the season, when the foliage has taken a yellow tinge, water is given in smaller quantities until the wood becomes fully matured. The shoots are then cut down to within a few eyes of the crown of the plant, and the pots placed on their sides under the stage of the greenhouse, allowing but little water until the following spring.

Since they have been kept over winter in a torpid state, they should now (March) be taken out of the pots, and the earth shaken off their roots, the plants shifted into pots from 10 to 12 inches diameter, using the soil indicated, observing to drain the pots perfectly, previous to placing in the soil. If they are required for an early bloom, they may be placed in a vinery or stove for a few weeks, and afterwards removed to the greenhouse, where they will produce an abundance of beautiful crimson flowers all over the top part of the shoots, and will last for a couple of months. As they advance in growth, neat stakes will be needed for their support. In their growing season they are all the better of liquid manure in a weak state once in two or three days, and occasionally syringed with soft water to keep down thrips and red spider.

After they have done flowering, cease to apply water at their roots; keep them rather dry than otherwise, so that the wood may become well ripened; this accomplished they are cut down as formerly, and afterwards treated in the same way as already recommended.

F.

THE SELECTION OF SEEDS.

THE time is at hand when people will be selecting and ordering their seeds for the ensuing summer, and here let me offer a little advice concerning this procedure. In the first place, be it observed, at least one-third of the contents of every catalogue may be considered worthless or superfluous; this is not so much the fault of the seedsman as might at first sight be imagined; it appears that one portion of the public will have new things and even things of doubtful character. Thus it may be affirmed that few of the seeds can be had genuine or true to name; this I boldly affirm, and it is the fault of the seed-grower and seedsman; the latter should insist on genuine kinds in such a way as to compel the other to grow them or lose his custom. I have had some 30 or 40 years experience in the purchase and growth of seeds, and can aver that I have not, during that long period, received 40 per cent. of what may be termed genuine kinds, excepting Peas, Beans, and Kidney Beans, which are generally pretty true to name. I speak here more particularly of the smaller seeds, such as Broccolis, Cabbages, Celerics, Beets, Endive, Lettuces, &c.

As for Cabbages, they might be had true enough to name 40 years since, for then we had but a few kinds, and those of definite character, such as York, Battersea, Sugarloaf, &c., now we have A's Superb, B's Nonpareil, C's Matchless, &c., all which names convey no idea of what the character of the Cabbage may be. But we pay very dear for those fine superlatives, and really I do not like to pay sixpence for the word "matchless," nor twopence or threepence for yellow or scarlet paper. Broccolis are a complete chaos; there are some excellent things in this way in the world, but the puzzle is how to get at them. I would at this moment take half-a dozen Broccolis of 35 years since against two or three dozen of "superb" of those times. Let it here be understood that I speak not of any one seedsman; far be that from me, I merely speak of what is termed "the trade," taking it in the lump. For my part, I never descend to personalities, and were I an editor of a gardening periodical, I would never admit anything that did so, believing that in our pursuit after real facts, we do well not to fall out by the way.

To return to our subject. Why should it not be an actionable affair in the case of spurious garden seed as of spurious farm seeds? After all, the public have the remedy partly in their own hands, and all they want is sound information concerning seeds in general, from some unbiassed and thoroughly experienced hand. Such information is to be found, and as the time is at hand for selection, I advise all those who are desirous of really good things to be careful in their selection; if they, however, must have something more—something with "superb" attached to it—why they must be content to pay the penalty very frequently attached to the thirst for mere novelty.

EXTEMPORE.

January, 1857.

CONIFERS AT CRAIGO HOUSE,

ON THE PROPERTY OF T. MACPHERSON GRANT, ESQ., NEAR MONTROSE.

(Continued from page 80.)

Pinus cephalonica (Endl.), from Mount Enos, in Cephalonia. Of this tree there are a great many planted, and scores of the specimens have attained to 10 and 12 feet in height, and several are 15 feet; branches spreading over 11 feet. This remarkably beautiful species seems quite at home in the locality. Many of the trees are making annual growths of about 16 inches, and appear as if they had never suffered from frost or climate. As is well known to

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planters of Conifers, this species is extremely capricious in its likings, and it is seldom that fine healthy specimens are to be met with in collections. It would be very interesting to know what is the cause which has agreed so well with this plant in this situation. The individual plants are situated in different aspects. A great number are planted all round a knoll which rises about 60 feet above the general level of the ground, and on every side, as well as on the very top, all seemed to thrive. Others were planted on level ground, much lower down than the general collection, and these were very well sheltered by other trees, and they were quite as healthy and vigorous. Its native region is a limited district on Mount Enos and some parts of Greece, where it grows on calcareous rock, at an elevation of from 4000 to 5000 feet above the sea level; an elevation which even in that latitude must subject it to a very low temperature at certain seasons of the year. I was not able to ascertain the cause of this species thriving so well here, while the Spanish *P. Pinsapo*, which is generally considered hardier and more suited to the climate of Scotland, does not thrive. Can it be the effect of geologic formation, exposure to sea influence, or to the proximity of the soil to limestone? I have known many individual trees, on both the east and west coasts of Scotland, equally well exposed, and in equally good soil, to all appearance, and yet have never seen any nearly so healthy as these trees. The forester on the estate told me that there were only a very few specimens of the common Silver Fir growing in the district; that they had been planted in different places, but none of them had succeeded. It would appear from this that there are special localities in our country suitable for the successful growth of certain species; and this may be the case with many other Firs, such as the Weymouth Pine, Balm of Gilead, Silver Fir, &c., as well as other trees and shrubs; and seems to indicate that though a certain plant may fail in several localities, yet some places may occur where it may not only prove a valuable ornament, but also a profitable timber tree. The plants of chalk and limestone districts seem to possess this peculiarity more than those found on other formations. I noticed that all the plants of this species had a fine brownish-green bark, with the upper sides of the shoots and leaves darker than the under sides; the branches produced, straight from the main stem at nearly right angles, neither ascending nor bending down at the tips; and that the fine thick sharply-pointed leaves, which were growing chiefly on the upper sides, were placed edgewise in the direction of the branch, and not lying flat, as in Silver Firs generally. The trees were of various outline—some being pyramidal, others nearly columnar, and some very straggling. Loudon doubted whether it was distinct from the common Silver Fir; but it differs from both it and *P. Pinsapo* in a remarkable twist which every leaf takes at the base, and in having two faint lines of white on the under side of each leaf. The branches, from the ground up to about half the height of each tree, were remarkably crowded—so much so that in some even a small bird could not penetrate the tree; but in the upper portions the branches not having had time to subdivide freely, that plant had a sort of naked appearance, with distinct whorls of branches, and from four to seven in a whorl. I learnt that all the trees of *P. cephalonica* had been planted about 18 years ago; the seeds having been imported by the late proprietor, Thomas Carnegie, Esq., who gathered them in Cephalonia.

Pinus Menziesii (Dougl.), from North-West America. Of this there is a very fine specimen, raised from seed, and which is now about 36 feet in height—branches spreading 21 feet, girth of trunk 4 feet; a truly noble plant, with far extending branches, rigid needle pointed leaves, which, as well as the young bark, have a fine bluish-green tinge. This tree is making annual growths of from 2 to 3 feet, but is beginning to lose some of the lower branches, by being too closely surrounded by other trees. I think this specimen not quite so fine, though taller, than the one at Keillour Moor, near Crieff, which has produced fertile seeds this year, and which is growing quite inland, with a south-western exposure, at an elevation of 400 feet, and on a very poor, wet, sour soil, which in a state of nature produces only rushes and heath—a soil and situation the very opposite to that at Craigo House. The Keillour

plant is 30 feet high, spread of the branches 27 feet, and the girth 4 feet 5 inches three feet above the ground.

Pinus Picea variegata. Of this, the golden variety of the Common Spruce, there is a fine plant, 27 feet in height, which grows very near to *P. Menziesii*, and is a perfect contrast to it in outline, having all the branches comparatively short, and all along the trunk, to nearly the top, of the same length, giving the tree a columnar outline, which, with the peculiar yellow tinge of certain portions of every branch render it very striking and ornamental. This seems to be the same age as *P. Menziesii*, and is a grafted plant, with a fine straight stem and a robust leading shoot.

Pinus picea var. *Clanbrasiliana* (Endl.) Several plants, about 3 feet high, and quite healthy.

Pinus orientalis, inhabiting the coast of the Black Sea and adjacent mountains to the east. There are several plants of this, about 4 feet high, very healthy and pretty, but slow growing.

Pinus sp. named *Whitmanniana*, quite hardy, but still small; very like some form of the Common Spruce.

Pinus Khutrow (Royle), from the Himalayas. Some small plants not thriving, having apparently suffered a good deal for the last two winters.

Pinus jezoensis, small plants, very sickly, and not likely, even under protection, to survive this winter.

Larix europea (Linn.), Alps of the south of Europe. Of this there are large plantations, about 40 or 50 years old, and which generally are not fine. The surface of the district seems too flat and retentive of moisture for the profitable growth of Larch. Some specimens which had been planted for American Larch in the Pinetum, but which are the true Tyrolese sort, seem to thrive better than the common variety. The Larch in this district had immense quantities of cones even at an early age, indicating an unhealthy state of the plants.

Cedrus Deodara (Roxb.) and variety *viridis*. Small plants which are healthy; only a few years planted out.

Cedrus atlantica (Manetti). Several very good plants from 6 to 9 feet in height—growing rapidly and quite hardy.

Pinus Cembra (Linn.), a native of the Alps in Switzerland. Several plants 9 to 10 feet—healthy.

Pinus monticola (Dougl.), a grafted plant about 5 feet in height, with a good leading shoot; healthy. There is a fine specimen of this at Keillour, 32 f. 6 in. high. Girth of trunk, 2 f. 9 in.

Pinus excelsa (Wallich), from the Himalayas; some small plants—quite hardy.

Pinus Coulteri (Don.), from Mount St Lucia, in California; a fine plant, about 4 feet in height.

Pinus rigida (Mill.), 8 feet high, not fine.

Pinus mitis, 7 feet; healthy, but a scrubby low tree, very spare of leaves.

Pinus tuberculata, several young plants, hardy; these have been planted only 2 years.

Pinus ponderosa (Dougl.), from North America. A good plant about 9, feet in height, hardy.

Pinus Jeffereyi (Bal.), several small plants; hardy as yet.

Pinus insignis (Dougl.), from California; not very healthy.

Pinus sinensis (Lamb), a few healthy grafted plants, about 8 feet in height very like *P. insignis* in colour, but more stunted in growth, and the leaves much shorter.

Pinus Benthhamiana (Hartw.), from California; this is the true sort, and not the spurious variety found in so many collections under this name; the plant is from seed, and is about 4½ feet in height; quite hardy, with a remarkably thick and succulent leading-shoot, and long leaves which grow in tufts on the upper half of each annual growth. The plant in this collection has twin leaders, which are both equally strong, and are adherent for upwards of a foot, this circumstance does not often occur in the Fir tribe.

Pinus Pinaster (Solander) Indigenous to the south of Europe, a plant about 25 feet in height, healthy, with plenty of clusters of cones.

Pinus resinosa (Solander) from North America, a fine plant about 10 feet in height. Not unlike *Pinus monspeliensis* of gardens.

Pinus Laricio, indigenous to Corsica, Spain, Italy, Greece, Austria, and various parts of the south of Europe; of this there are a great many young trees varying from 6 to 22 feet in height, consisting of nearly all the varieties of this most variable species. Charles Lawson, Esq., of Borthwick Hall, who was the first to draw attention to the importance of this species as a timber tree suited to the climate of Great Britain, remarked many years ago, when examining the native forests with the view of procuring seeds for importation, that the trees from the more southern regions such as Sicily, Corsica, and Calabria, grew taller and more rapidly than those from more northerly regions, such as Montpellier and Mount Taurus; he also found that the boles of the trees in the southern forests kept their girth without any sensible diminution, to a great height and that the branches were short and had little or no swelling at the point of union with the trunks, the trees from northern forests did not grow so tall and lost their girth rapidly, and had large knobs or swellings at the point of union, the timber from the trees of the former kinds was clean without knots, pale yellow, and not very resinous, whilst that from the latter was more knotty, richer yellow in colour, and very resinous, more like well grown old Scots Fir timber. The trees in this collection consist of all the various forms, from the slender short branched, pale, green, tall, columnar kinds from Corsica, to the thick, bushy, sombre green sorts, commonly known as *Pinus austriaca* and *P. Pallusiana*; when this tree is cultivated for long timber or for nurses to other trees, the true Corsican or southern forms should be planted, especially if the situation be low, to admit of the trees getting up to a good height, without being laid to one side by any prevailing winds; but when the object is shelter, or the production of durable timber of best quality, then the Austrian variety should be planted. All the varieties are easily raised from seed if sown the first year after it is ripened, and they have all this recommendation, that they thrive in a great variety of soils, and at various elevations.

Pinus pyrenaica (Lap), and the variety *monspeliensis*; several good healthy plants from 4 to 6 feet in height.

Pinus uncinata, with fine, straight leading shoots, and short brush-like branches thickly clothed, with blackish green slightly bent needles, the true Spanish variety and the plants raised of the seeds sent to this county by the late Captain Widdrington. I have not seen anywhere such fine healthy robust plants of this beautiful and distinct tree as those in this collection. They are from 6 to 7 feet in height. There are also several good specimens of the varieties *P. uncinata rotundata*, a stiff-growing low tree, with bent foliage; and *P. humilis*, prostrate, with many leading shoots; and *P. obliqua*, a very sprawling dwarf growing tree; and *P. pyramidalis*, the latter a very singular and splendid plant, 21 feet in height, 17 feet in diameter, with a great many leading shoots—all of which have been produced by the elongation of the root branches. The general outline of the tree is that of an enormous Irish Yew, but without the stiff rigidity of that plant; for the pyramidal mountain Pine has all its branches proceeding from the main stems by a gentle and elegant upward curve like the arms of a chandelier, and it appears as if it would attain to twice its present height. The colour is a paler green, and the foliage is finer in texture than any of the other varieties of *P. uncinata*. An avenue or group of this remarkable variety would be very effective in decorative planting.

Araucaria imbricata, (Pavon), from Southern Chili. This tree stands about 21 feet in height, and is a perfect picture of symmetry and health, the branches spreading over 14 feet, and the circumference of the trunk 2 feet, 8 inches.

Taxodium sempervirens (Lamb), indigenous to Western North America, California, &c., a healthy plant about 6 feet in height; quite hardy.

(To be continued.)

ON STANDARD ROSES.

BY MR THOMAS APFLEBY, ROSE MOUNT NURSERY, YORK.

I have been favoured with the January number of the *Scottish Gardener*, which I have read with much interest; and being an extensive cultivator of Roses, my attention has been particularly drawn to an article on the Standard Rose—so, at least, it is headed, but the contributor (T. M. L.) confines his remarks more particularly to the stock most suitable for Standard Roses in Scotland, and, to my mind, he is very much “at sea” with his subject. I will endeavour to point out to your readers the inconsistency of his remarks; but before I do so I may say that I never like anonymous writing—it does away with half the weight or force of any argument—and if T. M. L. should have anything to say in answer to this contribution, I hope he will sign his name to it. If people have confidence to write, and faith in what they do write, why not sign their names, and stand or fall by their opinions. It occurs to my mind that T. M. L. is a nurseryman, and fancies he has made a grand discovery!—found out a secret worth knowing—and that in a year or two he will be able to supply all Scotland with Standard Roses (and have to spare for exportation) upon “native stocks,” which will flourish without cultivation; and that it will be a great boon to all lovers of Roses in Scotland to purchase them and no others—nay, he even goes so far as to say that it will be to the advantage of Rose fanciers in England to buy them! Now, supposing that he is a nurseryman (but it matters not for my argument whether he is or not), I wonder he did not keep his discovery to himself for a couple of years, and so have stolen a march upon his less discerning native brethren, by being the first in possession of a large quantity of Standard Roses upon native stocks—it might have been half a fortune to him. But what are the lovers of Roses in Scotland to do for a supply until those “new prodigies” are brought out? I suppose they must be satisfied with repining over the remnants of their past folly, and regret that such a “genius” as T. M. L. did not appear amongst them sooner. Now, let us see in what consists the superiority of those “native stocks.” Is not the “Dog-Rose” which is found to be indigenous to Scotland the same “Dog-Rose” wherever it is found? and what is to make a stout well grown plant of it from England or the south of France inferior to one grown in Scotland? T. M. L. says—“nearly the whole of the Standard Roses at present cultivated (how cultivated?) in Scotland have been either transported from the Continent or the southern counties of England, and are consequently worked upon the stock most readily procured in the locality from whence they came”—thence inferring that other than the “Dog-Rose” have been used for stocks, which I daresay he well knows (or ought to have known before he began to write on the subject) is not the case. He then goes on to say “how ill adapted this stock must be (for Scotland, of course), removed as it originally was, from some hot and sunny bank or sheltered nook of rich dry alluvial loam on the southern shores of England or France, where an early and hereditary constitution has been acquired, badly suited, under any circumstances, to endure the rigour of our cold, bleak, northern winters, our light soil,” &c., &c.; and, “then to be the sole support of a southern bred scion, with a natural constitution unfit for Scotland.” [Aye, “there’s the rub,” which I will speak of presently.] Well, the poor French and English stocks have got a dressing from T. M. L., after doing their best, under the circumstances, to beautify the hills and glens of Scotland; but they will do better yet, with fair play, and when they are better understood. But has any one seen the “Dog-Rose” growing, much less thriving, on “dry, hot, and sunny banks on the southern shores of England or France?” I do not believe that it is to be found in such situations; but supposing it is, then, I should say, it would be more suitable for the light soils in Scotland which T. M. L. speaks of, as it would be “from the same to the same.” But it is more probable that those stocks have been brought from

some good strong and rich alluvial soil at a respectful distance from the "shores" of England or France. And will they not have acquired, in such a situation, a degree of strength and vigour which they could not acquire on the hills of Scotland? And will not the climate have ripened, and so fitted them better to withstand the cold, bleak, northern winters, than the late-growing, half-ripe stocks on the hills of Scotland? Is it not a well known fact that when we, in England or Scotland, have a hot summer and a dry autumn, all trees and shrubs, &c., in our native countries get more perfect in growth and better ripened, and consequently are known to withstand the severity of the following winter better than they do after a cold summer and a wet autumn? I must here quote another sentence of T. M. L.'s communication. He says:—"So satisfied are the generality of English Rose growers of the advantages to be derived from having their Roses budded on their native stocks in preference to having them on the French (?)—as well in a commercial point of view [only] as in having an article much better suited to their soil and climate—that they now rarely or ever think of cultivating plants upon the latter stock (?) " What nonsense! The stocks are the same—all the difference being between good stout and healthy stocks and bad ones. I got Standard Roses from the south of France only last spring (a distance of seven or eight hundred miles from here), and the roots were superior to any I ever saw—the stems stout and straight, and the tops first rate—in fact, I never saw better Standard Roses in my life; and I have seen many of those growing this last summer, and nothing could do better. And do not the Americans get large quantities from England every year? and are not their winters more severe than in Scotland? If stocks were used which are indigenous to France and England, and not to Scotland, then it might be supposed that the climate or soil was not suitable for them; but such is not the case; and the failures spoken of by T. M. L. must be traced to some other source than the stock; for I apprehend it is not the stocks that fail, but some sorts of Roses which are worked upon them that are too delicate for the climate of Scotland, and partly also by a want of a proper knowledge of their nature and requirements as to cultivation and pruning, &c. Does not T. M. L. say that "those French and English stocks (or some of them) were probably worked with southern bred scions [buds—they are not grafted] with a natural constitution unfit for Scotland?" And herein—and in the cultivation—lies all the mystery (to him) which he has been at so much pains to write about.

Why do the gardeners in Scotland select Roses with such constitutions? I suppose not knowing which are, and which are not suitable for their climate. Now, supposing T. M. L., or any one else, to have a lot of fine native stocks well established, and they bud them with Roses only suitable for the climate of France, or with hardy sorts of diminutive growth, which will not keep pace with the growth of the stocks, do they expect that their native stocks will preserve such sorts of Roses from decay and early dissolution in the climate of Scotland? There are many, even very hardy sorts of Roses, quite unsuitable to work on standard stocks. If a dwarf and delicate growing Rose is worked upon a vigorous stock it may live for a year or two, but its nature is such that it cannot appropriate the sap of the stock as it is produced, and in consequence of this the stock makes many efforts to maintain its natural vigour by continually throwing out its natural shoots, and also suckers from the roots, and the gardener as constantly cut all those away, with the idea that he will force all the strength into the Rose; but the Rose cannot, because of its nature, appropriate the sap as it is produced, and the consequence is, that the stock being prevented from making shoots, also refuses to make roots, and in a short time dwindles and dies, and all the blame is laid to the foreign stocks—whereas the same causes would produce the same effects either in France or England, or elsewhere. If only hardy and free growing sorts adapted for the purpose and the climate are worked upon standard stocks, and those stocks the "Dog-Rose," no matter where they come from, they will thrive in Scotland with proper management as well as anywhere else. T. M. L. says there

have been frequent complaints, such as "we cannot get the stocks to succeed," "we haven't sun enough," "the climate's not suited," "the soil's not the thing" or "the buds don't take kindly," and so on—the usual apologies for mismanagement. Well, until I got to this part of T. M. L.'s ingenious lecture, I thought he was a Scotchman, but now I really think he must be an Irishman, for after writing all this time about the failure of Standard Roses transported from France and England into Scotland, (ready-made of course) he now goes back and says they "couldn't get the stocks to succeed, nor the buds to take." As a matter of course, if the stocks did not grow, it is quite certain the buds wouldn't take. But if a person cannot grow a Cabbage, that proves nothing against the Cabbage, because it is well known that a Cabbage can be grown—even in Scotland—but perhaps Cabbages are better understood there than Standard Roses. I don't know any gardeners in Scotland (I have not been there), but I know many Scotch gardeners in England—first-rate chaps—who could, without any difficulty, grow Standard Roses—even in Scotland—and without native stocks. I don't mean to say a word against the stocks which might be collected in Scotland, because if they are strong and healthy, as T. M. L. says they are, I don't see why they may not answer as well (not better), as from any other place; but it is either downright ignorance or selfishness, to condemn all others as inferior to them, or unsuitable for the climate. If the Standard Roses annually imported from the south into Scotland are "the whip-cord looking stuff" T. M. L. represents them to be, the buyers themselves are to blame for dealing at establishments where such are supplied; because very, very superior plants, in great abundance, are obtainable in other establishments. I will not enter into instructions for collecting, dressing, planting, and budding stocks, because that is the nurseryman's business; but I will caution every one having either stocks or Roses to do with, not to "open a trench two feet deep to put their roots into;" or they will soon find the roots all rotten. Rose dealers must indeed, feel very much obliged to T. M. L. for his very minute instructions on this point; or it may be, that he intends gardeners in private establishments to form Rose nurseries.

Having now finished my comments upon this "long chapter of absurdities," I will conclude with a few observations on the culture of Roses whether worked, or on their own roots, and upon this, and the choice of proper sorts for standards and for the climate, as I have said before, hinges the whole of the difficulty T. M. L. has been writing about. There has been a good deal written on this subject in many publications, and therefore, my observations shall be short. I will not enter into a long detail about the fittest situation and soil, &c., for few people have the choice of the former, and if the latter is strong and rich so much the better, but if it is not so, every means at command must be used to make it so, or approaching to such a state. It should be trenched two feet deep, previous to planting, and if naturally strong will only require to be well mixed with good manure, but if light, the most suitable materials obtainable must be well mixed in with the trenching, and cow manure will be best for light soils. I need not tell any one who professes to plant Roses, how to plant them, but as soon as planted, the standards should each be secured to a stout stake, and a mulching of long litter put round them. If it is autumn this will keep out frost, and if spring, it will keep out drought. Water abundantly in dry weather—occasionally with liquid manure; and keep flies off by frequent use of the syringe or engine. The above, though brief, is sufficient instruction for the first year. An annual dressing of manure, and proper pruning must be attended to, and the watering and syringing repeated in the growing season as before. Every third year at most, all the plants ought to be lifted, early in November, which is the best time to plant; the ground trenched and manured, &c., as at first, and the Roses replanted—first shortening the roots—for if allowed to stand longer unmoved, the roots get into the subsoil where there is no food for them, and besides, they get naked, i.e., clear of fibres (feeders, of course), and in such a state how can they be expected to thrive?

When lifted every three years, the fibres multiply amazingly—are kept near the surface, where they get both air and plenty of food, and the result is that they will keep in health and vigour for a great length of time. Now, this is the whole secret of Rose growing, presuming of course, that they are properly pruned annually. If T. M. L., and his unfortunate friends who have had so many failures with Standard Roses will follow those instructions, we shall hear no more complaints of foreign stocks, for depend upon it, it is not the stocks but the constitution of the Roses and the management of the plants which will ensure success, or the reverse.

NOTICE OF MR WILLIAM CUTBUSH'S NURSERY, BARNET.

This nursery is situated almost in the middle of the high and healthy town of Barnet, which is about ten miles distant from London, and about a mile from the Barnet station of the Great Northern Railway. In stage coaching days Barnet was considered the largest posting town in Europe, being the first stage out of London on the Great North road to York and Scotland, and strange to say, this nursery stands in a triangular piece of ground, bounded on the one side by the road to York, &c., and on the other by the road to Liverpool and the north-west of England generally, and occupies what is allowed to be the highest table-land in England.

This is one of those nurseries which have of late years made very rapid progress in the way of glass erections, and in the growth of plants for exhibition purposes—thanks to the encouragement which horticultural exhibitions have held out to such progress. Within the last two years there have been several very commodious span-roofed houses erected here, both for the growth of show specimen plants, and of “half grown” and younger stock. The most recent addition has been a very nice stove and propagating house adjoining, and close to these there is in progress another erection, which I was informed is expressly for young stock, especially of Heaths, Azaleas, and greenhouse plants in general, of which there is a large stock of healthy plants crying out for more space.

I cannot within the limits of this paper give anything like a general or minute sketch of the many fine specimen plants which I observed here, and will therefore just notice a few of what might be considered the most striking in point of size and merit. In the stove department, not the least conspicuous is the *Thysacanthus rutilans*, with its profusion of scarlet flowers. This is a plant which may be strongly recommended for winter flowering, and the specimen in question, which is 3 feet by 3½ feet, has been in flower for the last two months. The sweet scented *Gardenia Fortunii*, 4 feet by 4 feet, and well set with flower buds, will soon be a charming object. *Ixora Coccinea* *superba* and *I. javanica*, both very large and healthy growing plants, which are already equal in size to the *Gardenia* already named, and will be noble specimens by the time they are in bloom. A magnificent plant of the lovely and highly odorous *Stephanotis floreunda*, covering a trellis at least 5 feet by 5 feet. The same may be said of the *Allamanda Schottii* and *A. cathartica*, a beautiful bush of *A. neriofolia*, upwards of 4 feet in diameter. This latter is a most desirable plant, from the fact that it can be had in bloom, from 6 to 8 months in the year. I also notice plants of *Dipladenia crassinoda* and *D. splendens* which had broken strongly, and giving every promise of well covering their 5 feet globular trellisses. These are lovely plants for cut flowers, and as they stand a greenhouse temperature when in bloom in summer, are well worthy the attention of all who have convenience to grow them. There is also a noble plant of *Rhynchospermum jasminoides* well set with bloom. This is a deliciously sweet plant, and is also adapted for greenhouse or conservatory decoration when in bloom. Among plants with variegated and otherwise fine foliage there are the several varieties of *Dracæna* *terminalis*, *ferrea*, *nobilis*. The last is perhaps the most ornamental of all the

Dracænas, and should certainly have a place in every collection of stove plants. I also noticed a fine plant of *Aphelandra Leopoldii*, and among *Begonias* there are *Thwaitsii* and *Poichenhian*; the latter I was informed thrives best under a bell glass; and I must not forget to mention a very fine plant of the splendid foliaged *Elæodendron retusum*, which for its graceful and striking appearance, should have a place among plants for grouping, to produce a striking effect. These with the general stock of young stove plants do great credit to those connected with them.

A large span-roofed house is wholly occupied with specimen *Azaleas*. On the side shelves all round the house is a fine stock of what are generally termed "half-grown" specimens, *i. e.* plants in pots ranging from 24's to 12's. The centre part of the house is densely filled with a quantity of large specimen plants, comprising all the most popular show varieties; all exceedingly healthy and well set with bud. Among them, there are particularly worthy of notice, immense plants of Duke of Devonshire Broughtonii (6 feet by 6 feet at least), *Lateritia concolor*, variegata, *Perryana*, triumphans, *Murrayana*, *Ailoria purpurea prestantissima*, all large plants trained in pyramids. Among the stock of smaller specimens, I noticed such as *Iveyanas*, *Admiration*, *Beauty of Europe*, *Criterion*, and many other fine varieties.

Another still larger span-roofed structure is exclusively filled with the most popular show greenhouse plants, all very tastefully trained and arranged. Conspicuous among these are some noble plants of *Aphelaxis humilis*, *A. macrantha purpurea*, *A. purpurea grandiflora*, and several other varieties. These are mostly all trained in the pyramid style, and present a much more natural appearance than the wheat-sheaf looking plants of those generally met with at the metropolitan shows. They average 4 feet in height by the same in diameter, and are feathered with blooming shoots to the edge of the pot, and are finely set with bloom. There are also some nice plants of the newer sorts of *Aphelaxes*, such as *Brucei* and *Walkerii*. I also noticed some particularly good plants of *Boronias*, especially *B. serrulata* and *B. tetrandra*; the latter an immense bush. A great plant, *Eriostemon Buxifolius*, occupies a position in the centre of the house, and is upwards of 5 feet in height and as much in diameter; well set with bloom buds. There are also some very symmetrical plants of *E. scabrum*, and the beautiful *E. pulchellum*, and several others; and here is also, perhaps the best plant in England, of *Hypocalymna robusta*, giving every promise of being a mass of bloom. *Phænocoma prolifera Barnsii* (which is certainly the best variety), and *Pimelæ spectabilis*, are also objects well worthy of notice, and are particularly healthy. The same may be said of *Statice Holfordii*, which gives every promise of being equally as fine as it was seen at the great shows last season, and which is certainly a plant well deserving of being cultivated, where cut flowers are in request in early summer; it lasts in flower for months. Mr Cutbush is in possession of what is considered the finest plant of the beautiful new *Genesthyllus Hookeriana*, which is well set with its pretty drooping blooms, which are a bright scarlet outside, very much like the *Lapageria rosea* in shape, and being seen from drawings is very much like the *L. rosea* in the inside of the blooms. This is likely to be a plant of great interest at the shows this season, and must tell well in a collection. There are also some young plants of the *Genesthyllus tulipifera*.

A third span-roofed house of considerable dimensions is wholly filled with specimen *Ericas*, among which are some very superb specimens indeed. I noticed particularly several large plants of *E. Cavendishii*, and a magnificent plant of the beautiful *E. Hartnellii*, upwards of 4 feet through, and perfectly furnished, and in robust health. *E. Macnabiana* is also fine, measuring 3½ feet by 3 feet. *Masonii*, the same size. *Jacksonii* still larger. Very fine specimens of *oblata* and *Parmentieriana rosea*, each more than 3 feet through. *elegans*, *inflata*, *aristata major*, *ampullacea major*, *Syndriana*, *Tortuliflora*, *Rollisonii* superb, and many other good *Heaths*, are well represented here, and are in good health. I noticed particularly that on the surface of the soil in which these are growing, there has been used an unusual quantity of white

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silver sand, which not only keeps the surface of the soil free from green scum and moss, but allows of a free circulation of water down through every part of the ball. In the pits and frames there are younger stock of all the plants noticed, in a thriving state, and inclusive of a collection of Epacris and Camellias, and a large quantity of young Azaleas.

Any one who visited this nursery several years ago, would not fail to see that horticultural science is surely progressing here, and the secret of such progress is simply the encouragement afforded by Exhibitions and an increasing trade.

THE CINERARIA.

What of the Cineraria? Does that remain *in statu quo*? Rather let us ask, where are now the varieties which, only five or six years ago, were held up as marvels? We could enumerate a long list, but such sorts as Beauty (*Gaines*), Emma (*Gaines*), Lady Ducie (*Gaines*), Mabel (*Gaines*), Novelty (*Gaines*), Sultana (*Gaines*), Crimson Perfection (*Appleby*), Coronet, Defiance, Magnet, Vernalis, &c., will suffice to illustrate our meaning. These were sorts in high estimation only a few brief seasons since. Where are they now? All gone out of cultivation, or only to be found in ones or twos in some distant establishment. We have now at command such quality, and our notions have, consequently, become so refined, that form or colour alone is no longer able to satisfy us. We must have colour, form, distinctness, profuseness of bloom, and habit, all combined in one individual, ere we can award it the palm of excellence. That the Cineraria should have made rapid progress is no wonder. Nature has been lavish in her gifts to this flower; every bloom yields a store of seed as fertile as abundant, requiring little or no artificial aid to insure vegetation; it possesses a constitution little short of absolute hardihood; makes rapid growth; is docile, and not over dainty either of food or locality. Hence it follows that such numbers are annually raised, cultivated, exhibited, and cherished by their originators, frequently for some supposed merit, not always apparent to those who have to scrutinise their quality when placed upon the exhibition table; and hence, too, the vexations and disappointments which mar the pleasurable excitement of seedling raising, common, indeed, to seedlings in general, but of very frequent occurrence in reference to the Cineraria. No flower now-a-days sustains these difficulties and disappointments in a greater degree, and every season increases them, so that it is a common expression, and one frequently repeated to us, that the chance of obtaining a really good Cineraria is now so obscure, that the task is all but hopeless. While we admit the truth of these lamentations to some extent, how many of these disappointments, we ask, might be obviated if raisers would pay a little attention to fertilizing, instead of leaving the operation to chance, and thus nourishing a rude and heterogenous progeny! The Cineraria but follows the universal law of nature unassisted by art—that of retrogression. Unfortunately it usually happens that the more readily a flower supplies us with seed, the fewer efforts are made to avail ourselves of the advantage. The common routine is to place our plants, as they go out of flower, on coal ashes, to leave fertilisation to chance, and finally, to pot the self-sown plants for after growths, simply because the family seeds so freely. This must not be, if we would avoid the vexations already noted. The time is past when chance could do all that was expected. We now need—and indeed have—such refined flowers that *to do* at all, we must perforce *do well*. Nor will the labour be in vain. The goal is not yet nearly gained; and though the race may be more difficult to win, let it be remembered that the course is in as good order as formerly; and if better stock is necessary, have we not high bred sires and dams wherewith to perpetuate an improved race? Let Brilliant (*Lidgard*), Optima (*Hopwood*), Oliver Cromwell (*Hopwood*), Emperor of the French (*Turner*), be the few

cultivated for perpetuation; before seeding time let the colours be classified and the plants set in distant places to afford less scope for chance hybridization; at the fitting time let the plants be fertilized with some decided object in view. Let these things be done, and we venture to prophesy that the operator will not be without his reward.—*Edwards' National Garden Almanack.*

LAYING OUT A FLOWER-GARDEN.

There are two things which contribute to personal adornment—good things to wear, and taste in putting them on. Without the latter item riches will only tend to make their possessor more vulgar; while with it a scanty wardrobe may be made to lessen plainness and add something to beauty. The remark holds good in relation to gardens, which require good flowers and a mode of arranging them adapted to their position, size, and colour. In one respect only the analogy does not hold good, since dress derives all its comeliness from the wearer, while flowers are intrinsically lovely. No one, however, who has compared a garden regulated with taste and judgment, with one in which the plants are put into it without any regard to their properties, will hesitate to agree with our general proposition.

We cannot enter into all the *minutiae* on which the full beauty of a garden depends; but we may indicate a few particulars which are most generally within the control of gardeners. However small or large a garden may be, there can be no question that Grass should occupy a considerable portion of it, out of which the beds should be cut in various tasteful forms. Some persons prefer gravel walks, and beds surrounded with Box, *more majorum* (which does not mean “more marjorum,” but “in the fashion of our ancestors”); their object being to save the trouble of mowing, and also to allow of walking dryshod in winter. But a garden should be so arranged that a gravel walk may make the warmest and most sheltered borders accessible in bad weather, while the central and more exposed portions should be made up of beds cut out of the turf, to be filled with exotics in summer. Supposing that a garden consists of a parallelogram, surrounded with walls, as is the case with such an appendage to most suburban residences, then we would have a border all round, next the walls; a wide gravel walk; and the centre occupied by a grass plat, out of which the beds should be cut according to the taste of the owner. In the autumn and spring this arrangement would allow of a good space for walking in, while in the spring and summer the middle beds would be got at easily, with the superior advantages over gravel walks of the beauty of the turf and the soft velvet-like carpet for the feet. With regard to the flowers with which a bed is filled, there is no comparison to be made between its beauty when surrounded with Grass, and when encompassed by Box edging and a gravel walk. We know no flowers which are not marvellously set off by a soft green setting of well-rolled and short turf in the spring and summer; while in the other seasons the Grass forms of itself an adornment, on which the eye rests with greater pleasure in proportion as the floral beauties are wanting.

The borders next the walls do best for mixed plants and flowers. Climbing Roses and flowering Creepers may be there planted, varying their positions according to their habits in relation to sunshine and shade. Roses of a standard habit, dwarf evergreens, and herbaceous plants, may occupy the centre of the border, and below, in all vacant spaces, may come the thousand and one pretty things which flower down to the winter and in the early spring. Russian Violets, Wallflowers, Aconites, Snowdrops, Crocuses, Auriculas, Polyantheses, &c., if judiciously planted in different aspects, will supply a few flowers at the worst seasons, and in mild weather a good bouquet may be gathered from some of them at Christmas time. The beds on the lawn should also be filled with bulbs in the autumn, affording that loveliest of spectacles,

a spring garden, which, if properly managed, is really as beautiful (some think more so) as anything the summer can afford. But this is a department of horticulture far less understood than it ought to be; for in the majority of cases beds are left with nothing in them till the time comes for "bedding out" in May and June. But this plan does not suit ourselves; and we are only waiting for these severe frosts to go to see our beds bristling all over with Snowdrops, Crocuses, early and late Tulips, Hyacinths, Anemones, Ranunculuses, &c., &c. As the two former appear in February and the late Tulips continue till June, we have thus four full months of beauty before many of our neighbours have put in their summer plants, which will not look thoroughly well until July.

As to what the central beds are to be filled with when the bulbs are removed, that must be left to the taste and resources of the owner. It is a good plan to see flowers in bloom one year, take their names, and get a supply the next spring. The catalogues which we notice from time to time are excellent guides for purchasers, and from them all that is requisite may be gleaned as to variety of colour, time of blooming, height, &c. Some things are indispensable, such as Verbenas, Calceolarias, scarlet and variegated Geraniums, &c.; and, if a garden is small, we had rather have a good supply of these favourites than single plants of a far greater variety. As a rule, all bedding exotics should have a bed for each kind, as the effect is better when scarlet Geraniums occupy one bed, yellow Calceolarias another, &c., than when they are mixed together.—*The Field*.

ONIONS—THEIR CULTIVATION, &c.

This valuable esculent, supposed by some to be a native of Spain, is what may be termed a biennial plant. But with regard to its native country there is room for grave doubts: go into what part of the civilised world we may, we shall probably meet with the Onion; and my purpose now, is rather to point to good maxims in its culture. Before proceeding, I will point to a few of the evils to which the Onion is liable; this will pave the way to a due understanding of the practice about to be recommended. The first thing I may name is the grub; perhaps, the thing most to be dreaded. Then there is the canker, which generally takes place at the bottom of the bulb when half-grown, and sometimes proves as prejudicial as the grub. Onions are liable to be "stiff-necked," as it is called; this both spoils their marketable value, and perils their keeping properties. Other evils there are, but they are trivial as compared with the above; one thing, I think I may affirm, that no esculent we have is more exempt from what is popularly called blights; meaning thereby the attacks of such microscopic enemies as many of the fungi; or, indeed, including those common pests of the garden, the red spider, the aphides, the snail, slug, &c.

It is a common ambition to endeavour to grow them as large as possible, but the policy is much to be doubted. Certainly very large Onions are a showy-looking affair, and make a figure in the fruiterer's shop-window, or on the exhibition table; but overgrown bulbs will, by no means, keep so sound or so long as those of more moderate size, and seldom will they harvest as well. But another point of much importance may be named—the economy attached to the use of moderately-sized Onions. How frequently we may see half an Onion left to waste, in household matters, simply because the Onion was larger than needed for the purpose. I will now speak of the seasons, with regard to their habits and culture, and may observe, that dry seasons in general suit them much better than wet ones; for although their fibres, when in the height of growth, love to revel in a somewhat moist medium, the bulbs, after attaining some size, abhor long-continued dampness. Indeed, the circumstance of such noble specimens being produced in the South of Europe—in such hot countries as Spain and Portugal—at once

points to what I have urged, and to the importance of warmth. Another point, as to the weather:—storms of wind are apt to be prejudicial to the crop, if they occur during rapid growth, and before the period for ripening; and if the plants are thrown partially prostrate, much injury accrues as to their size; part of our cultural directions will, therefore, bear on this point.*

A deep and generous soil is requisite to produce first-rate crops; the soil should be eighteen inches in depth, but they will descend nearly a yard if the soil be suitable: this points to the propriety of deep digging or trenching, of which more in the proper place. As to texture, a sound or loamy soil, if not too adhesive, will produce finer Onions than a light or sandy one; the former, however, will be a later harvest. One single fact may here be noticed, as bearing on the rotation of crops in gardens; the Onion will probably endure repetition better than almost any other vegetable.

The neighbourhood of Hexham, in Northumberland, has long been noted for its Onion culture; and there, we are informed, the market-gardeners have grown their Onions on the same plot for at least twenty years in succession; they used merely to dig the beds, and then spread rotten manure over them, in which the seed was sown; the soil from the alleys covering it. I will now detail my own practice in cropping this root,—first observing, that few have greater success since I adopted this course, and this on the very soil where, a score years since, I could rarely obtain a crop worth notice. I seldom use manure for them, preferring to follow a crop of any kind for which deep trenching had been practised, and which had been also well manured for that crop. This I was given to understand was the practice many years since, with certain market-gardeners about the metropolis; some of whom, after manuring heavily, took a crop of Broccoli, Cabbage, or some such scourging crop from the ground intended for Onions. And such is my practice; but sometimes I seize on old Asparagus beds, which are excellent for high Onion culture. Our soil is a sandy loam, but not particularly loose; in fact it produces all kinds of vegetables in much perfection—Asparagus excellent. The ground is trenched very deep, generally two feet or more; and I make a point in all trenchings, to bring up a little of the subsoil—say two inches. This subsoil is an article of a coppery colour, in texture rather an adhesive sort of sand, if such a term may be admitted. The ground thus handled is set out in beds four feet in width; alleys about fifteen inches. A dry time is chosen for the operation, and the beds being marked out are trodden firm; this done, all the soil which can be obtained in a fair way in the alleys is thrown on the beds, my object being to raise them from six to eight inches above the ordinary ground level. The soil is trod again, and then slightly levelled with the rake; the operator making the beds slightly convex on the surface. They are now ready for sowing; and my practice is to mix all my kinds together in the bowl—the kinds being generally about equal parts of Deptford, James's, White Spanish, Portugal, Lisbon, &c. By this plan I never miss a crop, for one bad sample is redeemed by a good one, and there is no difficulty in sorting them at harvest time as far as is requisite. We slightly sprinkle the seed in order to make slaked lime adhere to it, the latter being a very useful guide to the sower.

About the thickness of sowing, I need say little; most persons know this: better, however, sow too thickly than the reverse, for the loss of a few ounces of seed is as nothing when compared with the loss of a crop. We cover the seed in general with a very small amount of the soil from the alleys; but before casting it over, we roll the seed in with a light wooden roller; the soil being thrown about one quarter of an inch in depth. Again we roll if dry; if not, we wait a week or so until they are so. Our beds now look almost like a well rolled terrace-walk; being firm, uniform, and at least six inches above the ground level. Henceforward they are carefully weeded; no hoe is permitted to break the crust, and not a weed is left at the final thinning. * * *

I may now offer a few remarks on drill-sowing, as compared with broad-

cast. Those who have always made a great outcry for huge Exhibition Onions, have been, as a matter of course, advocates of the drill system; and I have seen Onions for show in drills a foot apart, the plants nearly 9 inches apart in the drill. This would not do for the market gardener, who farms for profit; and who cares more about the aggregate produce from an acre, than about the size of the bulbs. For my own part, in the advice I here offer, I simply recommend what is most profitable, most certain, and most convenient: to write directions for the culture specially, of the largest Onions would burden our present subject. I would here ask those who thin out to such distances for the sake of very large bulbs, what position they are in, providing the grub molest them? By the bed system, I always defer my final thinning until they are supposed to be nearly out of danger; and although I have been occasionally troubled with the grub, I have for years insured a full crop. This then is one of the chief advantages of the bed or broadcast system, over that of the drill; certainly the drills may be put very close together, but I see not their utility, and the drilling an acre or two amounts to some expense. Indeed I should always fear that the seed would be buried too deep by the drill system, for it is well known that the lighter the seed is covered, the better: they abhor deep covering, which is sure to lead to stiff necks. I have had repeatedly by the bed system, a score or more Onions completely meeting each other in the bulb, so that they appeared just like a pavement; the Onions averaging 3 inches in diameter. Now it has occurred to me, that it must be possible to obtain a whole bed or beds of the same character; for what is done on a square yard may be done on an acre; the same conditions being attached to them. I have attempted this, but have never been able quite to attain it. I recommend the consideration of it, however, to the readers of the *Price Current*; to whom I have had the honour of offering practical advice in former years, and which I trust, has been of service to many.

I come now to speak of harvesting the crop; a somewhat important process. I have before urged, that high beds, being drier in the main than those on the ordinary level, produce an earlier harvest, as well as promote the soundness of the bulbs. My practice has been for years so to manage these things as to obtain a thorough good crop of Coleworts, on the very ground cropped with Onions. This is rather sharp practice, but is an economical course; and I name it here as a collateral proof of an early harvest in the Onion way. The great benefit of high beds is, that any drought occurring after the Onions are full-grown, they speedily sink towards rest, and there is very rarely occasion to bend down their necks by hand: stiff-necks are rarely seen; I should say that we have not on an average five per cent of such. My practice is, in pulling the crop, to place them on gravel-walks, exposed fully to sun and wind; the root end of all the bulbs being laid to the south. Here they lie for a fortnight or so, when they are turned and their heads put to the south; in another week generally they are fit to house, and carefully watching the weather, I seize them when thoroughly dry, and house them in a very dry room. Those who have an opportunity, may after rough-dressing them, put them in hampers, and place them in a fire-heated room, the hotter the better; they may remain thus for a fortnight, and will be found to keep all the better. If I had a room of the kind, I should prefer a temperature of 80° to 90° if attainable; there can be no question but this high temperature would give them keeping properties, and render them less disposed to sprout.

I may here observe that in thinning out our beds, we do so at twice; the first thinning throws them about two or three inches apart: they thus remain until they nearly commence bulbing, when they are thinned to from five to six inches. We are not very particular, however, as to their being very regular; but swerve from that distance occasionally, for the sake of superior looking plants. When it is necessary to use manure, I always prefer it very rotten, and take care to bury it at least four inches from the surface of the soil; and in such a case I coax the young plant with a mixture of soot and

guano, three parts soot to one of Peruvian. This is well raked in, to divide it amongst the surface soil, or otherwise it might prove too strong for the young plant; it is applied before sowing the seed: salt and soot would prove beneficial, perhaps, either worked in the soil, or strewn over the manure before spreading. I may here repeat my firm conviction, that however much we must admire the hand hoe as a cultural implement, I am persuaded it does as much harm as good in the case of Onions: the benefit it may confer by loosening the soil, which in this case is somewhat problematical, is more than counterbalanced by its rendering the Onions more liable to be bent or toppled by the winds. Onions, there can be no doubt, should stand up, if possible until they ripen.—R. ERRINGTON, in *Rendle's Price Current*.

RUSKIN ON GRASS.—Gather a single blade of grass, and examine for a minute, quietly, its narrow sword-shaped strip of fluted green. Nothing, as it seems there, of notable goodness or beauty. A very little strength, and a very little tallness, and a few delicate long lines meeting in a point—not a perfect point neither, but blunt and unfinished—by no means a creditable or apparently much cared-for example of nature's workmanship; made, as it seems, only to be trodden on to-day, and to-morrow to be cast into the oven; and a little pale and hollow stalk, feeble and flaccid, leading down to the dull brown fibres of roots. And yet, think of it well, and judge whether of all the gorgeous flowers that beam in summer air, and of all strong and goodly trees, pleasant to the eyes or good for food—stately palm and pine, strong ash and oak, scented citron, burdened vine—there be any by man so deeply loved, by God so highly graced, as that narrow point of feeble grass. It seems to me not to have been without peculiar significance, that our Lord, when about to work that miracle, which, of all that He showed, appears to have been felt by the multitude as most impressive—the miracle of the loaves—commanded the people to sit down by companies “upon the green grass.” He was about to feed them with the principal produce of the earth and the sea, the simplest representations of the food of mankind. He gave them the seed of the herb; He bade them sit down upon the herb itself, which was as great a gift, in its fitness for their joy and rest, as its perfect fruit for their sustenance; thus, in this single order and act, when rightly understood, indicating for evermore how the Creator had entrusted the comfort, the consolation, and sustenance of man to the simplest and most despised of all the leafy families of the earth. And well does it fulfil its mission. Consider what we owe merely to the meadow grass, to the covering of the dark ground by that glorious enamel, by the companies of those soft, and countless, and peaceful spears. The fields! Follow but forth for a little time the thoughts of all that we ought to recognise in those words. All spring and summer is in them—the walks by silent, scented paths—the rests in noonday heat—the joy of herds and flocks—the power of all shepherd life and meditation—the sunlight upon the world, falling in emerald streaks, and falling in soft blue shadows, where else it would have struck upon the dark mould, or scorching dust—pastures beside the pacing brooks—soft banks and knolls of lowly hills—thymy slopes of down overlooked by the blue line of lifted sea—crisp lawns all dim with early dew, or smooth in evening warmth of barred sunshine, dinted by happy feet, and softening in their fall the sound of loving voices: all these are summed up in those simple words—the fields—and these are not all. We may not measure to the full the depth of this heavenly gift, in our

own land; though still, as we think of it longer, the infinite of that meadow sweetness, Shakespere's peculiar joy, would open on us more and more, yet we have it but in part. Go out, in the spring time, among the meadows, that slope from the shores of the Swiss lakes to the roots of their lower mountains. There, mingled with the taller gentians and the white narcissus, the grass grows deep and free; and as you follow the winding mountain paths, beneath arching boughs all veiled and dim with blossom—paths that for ever droop and rise over the green banks and mounds sweeping down in scented undulation, steep to the blue water, studded here and there with new-mown heaps, filling all the air with fainter sweetness—look up towards the higher hills, where the waves of everlasting green roll silently into their long inlets among the shadows of the pines; and we may, perhaps, at last know the meaning of those quiet words of the 147th Psalm—"He maketh grass to grow upon the mountains."—"Modern Painters," Vol. III., p. 231.

BASS AND BROWN'S CATALOGUES OF FLOWER AND VEGETABLE SEEDS, BULBS, GREENHOUSE AND OTHER PLANTS, &c. FOR 1857. Sudbury, Suffolk.—These contain in a small compass, all that can be wanted in either large or small gardens. Their assortment of seeds for the flower garden deserve the attention of our readers, being selected with reference to the size of the garden and the means of the owner, as to greenhouse, hotbeds, &c.

CULTURE OF THE RANUNCULUS.—In spite of all that practical writers on the Ranunculus have inculcated in regard to the necessity of making the beds early, it will be found that five florists out of six neglect the precaution; and then the complaint is raised, that the flower is uncertain and of impossible culture. It is, without exception, the first of florists' flowers; yet, alas! how many conclude that it is of impossible culture, as they, for their part could never grow them year after year, while the fact is simply, they never fairly tried. I will now point out my method by which I think this far famed flower may be grown successfully. As early in February as "Jack Frost" will permit, let the soil of the bed be dug out eighteen inches or two feet in depth; put in six inches of rich old pasture soil, and then prepare the following solution:—fill with rain water a large cask; put into it one bucket full of *fresh* cow manure, and stir it up well until it acquires the consistency of thin gruel; then pour this upon the six inches of pasture soil until it is completely saturated. In about five minutes the liquid will be absorbed. Carefully remove from the surface of the soil any small lumps of manure which may be left thereon. Then put on four inches of soil, saturate this as before, and repeat the process of removing any pieces of straw, &c. Put on another four inches of soil and again saturate with the liquid. Lastly, put on four inches of soil mixed with silver sand, by which the surface is prevented from cracking, the greatest disaster to the Ranunculus bed. When the bed cracks the moisture quickly evaporates, and the long delicate roots are destroyed, hence the necessity in dry seasons of covering the whole bed with a thin coating of sand. Let the bed remain untouched till planting time, which will be about six weeks after, towards the middle of March. When the plants begin to grow vigorously, I would recommend watering once a week with *weak* liquid manure. It should be applied very weak; the danger of error lies on the side of strength. To use liquid manure very weak and very often is, in fact, to imitate nature, than whom we cannot take a safer guide. It must be borne in mind—first, that liquid manure is an agent ready for immediate absorption, its main value depending upon that quality; secondly, that its effect is to produce luxuriant growth; and thirdly, that it will continue to do so, as long as the temperature of the atmosphere is sufficiently high, and the rays of solar light are sufficiently powerful to enable the plant to assimilate its constituents. These propositions rightly understood, indicate the true mode of applying it. It is evident that the period in the growth of a plant at which it should be applied entirely depends upon the nature of the plant, and the object to be gained. In the case of the Ranunculus, where a fine head of bloom is desired, liquid manure should be given when the flower bud is formed, and just about to swell. If the foregoing rules are strictly adhered to, a fine bloom of the Ranunculus may be certainly obtained.—HENRY T. BOBART in *Gossip for the Garden*.

WHY WEEDS GROW APACE.—There may be 130 flowers having seed-vessels on a single plant of Groundsel, and in each seed-vessel there are 50 seeds. Thus, one Groundsel seed is father to 6500 sons, more than there are of visible stars in the firmament. Many of these settle where they cannot live; many exist only to be eaten by birds. It is not meant that all seeds should produce plants; very many are as much bread to the birds as seeds of corn are bread to us. If, however, by an accident, every son to which a thriving Groundsel seed is parent, grew up, thrived, and produced new seed in the same proportion—an impossible assumption—the descendants of a seed of Groundsel in the second generation would exceed in number 40,000,000; the telescope itself has not enabled us to see so many stars. Chickweed is less prolific; though, indeed, even that may produce as many as 500 seeds upon each plant. But, then, look at the red Poppy. It can yield 100 flowers from one root; and from each flower can develop no less than 500 seeds; 50,000 may, therefore, by chance be the number of its offspring. Black Mustard and wild Carrot produce families of magnitude about equal one to another. One may, when in perfection, produce 200 flowers with six seeds in each, the other 600 flowers, with in each two seeds. One Dandelion root may have 12 flowers, while each Dandelion flower yields 170 seeds. The seeds of one Sow-Thistle may number 25,000. One plant of stinking Chamomile may yield 40,000, one plant of Mayweed 45,000 seeds.—*Household Words.*

THE PRACTICAL MANAGEMENT AND CULTIVATION OF A POD OF TULIP SEED, WITH THE RESULTS.—In the year 1848, a fine flamed byblœmen Tulip broke from a short cupped, and remarkably clean breeder, name unknown, but supposed to be a Maid of Orleans of the finest strain. This splendid flower was impregnated with the most pure, and perfect feathered Rose I had upon my bed. It was then covered with a glass, and perfectly secured from any chance impregnation by bees. The seed pod was gathered as soon as the stem had ceased to convey nourishment to the seed, and placed in a small paper box. In the month of March, the following year, I opened the pod, and examined the seed carefully, by taking each between the finger and thumb, and holding it before the light. I reserved all which had a germ, viz., a small mark at the bottom of the seed. Having procured a strong wooden box, 18 inches long, by 14 in breadth, with four holes at the bottom, each hole being 2 inches in diameter, I then dug a hole, 6 inches deeper than the depth of the box, and broader and longer by 4 inches. At the bottom of the hole, a brick was laid at each end; and having put the box on the bricks, so as to leave a hollow space under it for drainage, I then filled up the vacant places at the outsides and ends of the box with ashes, to keep out worms, &c. Having placed a quantity of broken crocks at the bottom of the box, to the depth of 2 inches to complete the drainage, it was filled with rich pulverised hazel soil. Each Tulip seed was then gently pressed into soil 1-8th of an inch. A sprinkling of river sand was then added, making the surface quite smooth and even. The seed was thus planted half an inch below the surface. The box, which was placed about a yard from a hedge, on a south border, which had the morning and evening sun upon it, was protected with a net work of strong thread, to keep off cats, dogs, poultry, birds, &c. The box was kept free from weeds, and examined after heavy rain, in order to replace any seeds which might be washed to the surface. In dry weather, after frosty nights had disappeared, I gave the seed a gentle watering. Seedlings began to appear in June, which I did not remove until July the following year; when I took up one hundred and seventy-three bulbs, raised from the above single pod of seed, and planted them in October, 2 inches deep, on a warm border, protecting them from sharp frosts during winter. I again took them up the following year in July, and found a dropper or two (or sinkers as they are called by some florists), attached to each bulb by a fine white fibre. The droppers were found sometimes four or five inches below the seedling bulb, and were generally larger than the mother bulb. The increase was more than doubled every year, by droppers only, until the bulbs produced flowers, when increase was obtained from offsets. Hundreds of bulbs are lost annually by inexperienced raisers of Tulips, who are not aware, that fine bulbs are to be found 4 inches below the parent bulb, attached to each other by fine white fibres. The whole of the above seedlings bloomed when five years old, some in the fourth year. It is a remarkable fact, that only two bizarre breeders were raised, the rest being byblœmens and Roses. I never saw a finer, or more pure bloom; nearly all were perfectly clean, and of fine form, so that I have obtained two important points, viz., purity and shape. The flower that broke first, was a superb byblœmen, with an intense black feather, which has already taken first class prizes: and others have since broken, equally good, if not superior. I must further observe, that only two flowers bloomed with blue bases, and scarcely one with pointed leaves; thus proving,

that with care, and proper selection of seed pods, a large number of fine formed and pure seedling Tulips may be obtained every year. Seedling Tulips, having stained stamens, impure bases, long cups, or pointed leaves, should be forked up, and destroyed when in bloom.—SAMUEL CRESWELL, in *Midland Florist*.

A FEW REMARKS ON THE CULTIVATION OF ANNUALS.

Annuals are propagated exclusively from seed. They are sown after two ways: the one in the borders where they are intended to remain, the other in prepared beds, from whence they are transplanted to the flower-garden. The former plan, although the most simple and most ordinarily adopted, has many inconveniences; one of the principal of which is, that the ground is occupied for a long period before they arrive at perfection. It would, therefore, be the more advisable, if it were possible, to sow all Annuals in prepared beds, and afterwards transplant; but there are some such as Poppies and similarly-rooted plants, that do not bear transplanting, so that these, under any circumstances, must be sown where they are to flower. It is also essential, in order to insure success in raising seeds of any kind, to bear the following important rule in mind:—That the smaller the seed, the less deeply should it be covered with earth; indeed, some seeds are so fine that they ought only to be sprinkled slightly over the ground, and should the weather at the time be very dry, a thin layer of damp moss ought to be placed over them till they begin to germinate; but there are few hardy Annuals that require such extreme attention as this, such care being more intended for the raising of Calceolarias and other minute seeds in pot culture. Again, where the soil is very rich, the seed ought to be sown much thicker than in a ground of a poor nature, otherwise the plants will grow too vigorously, and produce more leaf than flower. The gardener ought, therefore, carefully to bear this in mind, as the gayness of the flower borders much depend on it; and in order to keep up a succession of bloom, he should sow every fortnight, in the prepared beds, so as to have a good supply of plants to replace those that are beginning to fade, as by a little attention to these matters, there is no reason why a garden should not be decorated the whole of the season with such beautiful Annuals as the *Nemophilas*, *Clarkias*, etc., etc., instead of only at one particular period of the year, as is now more frequently the case. He should also give especial care to the arrangements of the plants, in order that, when in bloom, the colours may so harmonise as to produce the greatest effect possible. Although, at the same time, he must not be unmindful that there are some flowers which do not make much show, yet they are as much required for their fragrance as others for the brilliancy of their blossoms: these, therefore, for the reason of their perfume, must be considered as indispensable to every garden.

BIENNIALS AND PERENNIALS.—The first of these are raised exclusively from seeds; the second by seeds and by divisions of the roots. *Biennials* are those plants that do not generally flower the first year, and are only in perfection one season, such as Wallflowers, Sweet Williams, etc. Gardeners generally sow these too late, and, consequently, have only small plants to place in the borders in the spring, instead of large and vigorous ones that ought to make a fine show at once. In order to insure the latter, they should be sown early in May, and afterwards pricked out at stated distances, into beds well exposed to the light and air. Among them will be found a few that are not perfectly hardy: these will require a slight protection during the winter. Although, as a rule, Biennials ought never to be covered if they can possibly support the winter without it; as it frequently happens, when protected, the plants commence growing before their usual time, and so spoil the beauty of the bloom for the following season. *Perennials*.—This numerous and important class of ornamental flowering plants will be found particularly useful both in large and small gardens. They consist of plants, such as Delphiniums, Lupinuses, etc., and are mostly herbaceous, dying down to the ground each winter, from whence they grow again at the ap-

proach of spring, and flower during the summer and autumnal months. These plants have a tendency to increase in size, and take up more space than is convenient to accord to them. They should, therefore, be taken up every third year, and divided into smaller plants, by which means the stock will be increased and the vigour of the plants considerably enhanced. From the preceding remarks it will be almost unnecessary to observe how very useful for decorating the borders these two classes of plants may become in the hands of a skilful gardener.—*From E. G. Henderson's Catalogue.*

AMATEURS' AND COTTAGERS' GARDEN.

So many things must exercise the mind and the muscles of the gardener (be he amateur, cottager, or professional), this month, that the difficulty in giving calendarial directions, arises not so much from any other cause, as from deciding properly where to begin and where to end; in short, how so to condense the directions on each head, as to be at once full and condensed—*multum in parvo*.

To give a few brief and general remarks, first of all, on the vegetable department, I will first call attention to what I consider an error, very general especially among amateurs and cottagers, in sowing the various seeds in this department, and that is the well named "lazy bed" system. Let me advise you for once just to try the single row system, and instead of sowing your Onions, Carrots, Parsnips, &c., &c., in beds, to sow them in drills, having no waste paths. On this system there is not only a great reduction of labour, but the ground can be kept in a far more healthy condition. The hoe can be plied with freedom when weeds make their appearance, thus saving many a sprawl and aching back. The surface of the ground can be kept loose, which in time of drought prevents evaporation, and in time of rain a hard and caked surface. In short, there is every advantage without any disadvantage that I can name, and I am quite sure that the crops can be attended to with one-half the toil and trouble. Another thing I see sadly neglected, and that is the walks in the cottager's garden; they are, instead of a source of pleasure, a nuisance; in nine cases out of ten, they are the lumber part of the yard. Now, it is not only desirable that crops should be good and well tended, but that a neat and cheerful appearance should pervade the whole, and there is nothing that aids so much as a trim, well kept path. If good gravel is not within reach, put all the small stones you can find in your ground on it from time to time, and drain it well, and keep it free from weeds, and with crops in straight lines, and a well kept path, I hesitate not to say your kitchen garden will be a source of greater pleasure than you are perhaps yet aware of.

Do not be in haste in sowing seeds in this department yet if the ground is heavy and wet; wait till a dry opportunity occurs. Any time this month is time enough for Onions, Parsnips, Leeks, and Carrots will do very well any time before the middle of April. Sow a pinch of Parsley, early Dutch Turnip, Savoy, Scotch Kail, Brussel Sprouts, and Lettuce, also another row or two of Peas and Beans at the beginning, and again at the end of the month, with a row of round Spinach between each row of Peas. Radishes should be sown two or three times this month. If Early Potatoes were not planted at the end of February, they should now be got in; the same is applicable to a few rows of Early Horn Carrots. Lettuces that have been wintered in some sheltered spot may now be transplanted, and if the weather be dry water them well two or three times a week. The dung that may have been used to mulch the Asparagus in autumn may be partly raked off, and the surface of the bed gently pricked over with a fork, but not over an inch or two deep. Strawberries should have all their dead leaves trimmed off, and have a good top-dressing of rotten dung put between the rows.

Herbaceous plants in the flower borders will now be on the move, and may

have some dung or leaf mould forked in between them and about their roots, but not to disturb them. In the greenhouse, the frame, or the window, there will also be a move, and any plants that are pot bound should have larger pots, using a light rich soil, and well draining the pots. Calceolarias, Geraniums, and Cinerarias, if not shifted last month, should be shifted at once: Camellias will be in bloom, and should be well supplied with water, and guarded from currents of cold air.

Scarlet Geraniums, Calceolarias, Verbenas, and all such like half-hardy plants that were potted off last month should be gradually hardened off till they can be transferred to temporary accommodation by the end of the month, thus giving more room to pot flowering plants, and if your stock be deficient continue to put in the required number of cuttings. Cucumber beds put up recently should not be occupied with plants till the rank steam has passed off, and the soil in the hills falls to a temperature of 80° . Then the Cucumbers may be planted out, giving them a watering at the roots with tepid water. Let them grow two or three joints, and then stop them, and afterwards stop them at every joint, or second joint, and they will soon fruit. Give air daily according to the weather, and range about 70° to 75° when you uncover the frame in the morning.

Let your lawn or grass plot be well swept and rolled, the flower beds intended for Geraniums, Verbenas, &c., be trenched up, and if poor, dunged, and the surface left in a rough state, so that the March winds and frosts may act upon the soil. Let cleanliness and order prevail, and gratification and pleasure is sure to be derived from a garden, however humble.

CALENDAR OF OPERATIONS FOR MARCH.

VEGETABLES.

This month is a very important one in garden operations, as planting and sowing of the principal crops should be done during its course; also nailing and planting all sorts of fruit trees. Plantations of Jerusalem Artichokes, Rhubarb, and Seakale may be made now, and by the middle of the month Potatoes of all sorts may be planted. In ordinary soils Ash-leaf, Kidney, and Forty-Fold are the best I know; but the American varieties do better on a stiff soil. Walker's Regent is valuable for a second crop. For a late sort for spring use, Lancashire Pink-eye deserves a fair trial; it resembles the old favourite Don; equal to it in flavour, and less subject to disease, which now-a-days is a great consideration. I have abandoned the Fluke; it has not supported the character it got from our southern neighbours, with me at least. Spring a few Ash-leaf Kidneys in a very slight heat to plant at the bottom of a south wall, and plant out before they are much sprung, or it will be labour in vain, besides a complaint from head quarters. Plant Early Cabbage and Cauliflower, and give abundance of air and a slight top-dressing to the latter under glasses. Stake the first crop of Peas if not done; it protects them from the cold spring winds, and prevents an attack from wood pigeons, and sow Onions and Leeks for a full crop; also, Cabbage, Cauliflower, Savoys, Brussel Sprouts, Spinach, Parsley, and Lettuce; and by the middle of the month a sowing of Early Turnip and Carrot, and another sowing of Turnip ten days after, as the first crop is apt to run. Sow a little Celery under glass for an early crop. Keep up a succession of Asparagus, Rhubarb, and Seakale; cover up the latter to blanch before it begins to spring. When well-grown it is a delicate vegetable and easily forced. Pay due attention to the Mushroom house, slightly syringing with tepid water; they should grow kindly now without fire heat. Protect Early Broccoli from frost, as a sharp night may destroy the first crop which is always of great importance. As seed birds are very troublesome to the Brassica family, it is advisable to sow carefully in drills, and perhaps putting a net over them at same time; there is no safety otherwise.

FORCING DEPARTMENT.

PINES.—If unfavourable weather or any other circumstance has prevented the shifting of succession stock intended for autumn fruiting, no time should now be lost in doing so. In plunging these in their growing quarters avoid by all means crowding the plants. Pines will bear being a little crowded in winter when comparatively at rest, but during the season of more rapid growth they cannot be crowded with impunity; and it is always better to have a dozen finely grown plants than a third more drawn and debilitated. Should the weather prove cold, with parching winds, do not increase the temperature much over that of last month. Endeavour by all means in bright weather to maintain a humid atmosphere. All pipes in pine pits should either be furnished with evaporating troughs or have an open gutter with a flow of hot water passing along it from the flow to the return pipe, and to and from which the water can be turned at pleasure. Every advantage should be taken on the mornings of fine days to give more or less air, shutting up early in the afternoon with sun heat, at the same time sprinkling the plants, walls, and paths, with tepid water. Whenever it is observable that fruiting Pines have started, let them have a good watering at the root; otherwise, if they have been kept dry, to bring them "up" the foundation of a stunted fruit will be laid. Fruit swelling off should have a closer atmosphere, with a higher temperature, say 70° at night, with a moist atmosphere, with occasional waterings of guano water or dung water in a tepid state. It is customary to have a boiler for the express purpose of heating water for watering Pines, &c., but a deal of trouble would be saved if a coil or two of hot water pipes were passed through a tank or cistern which would insure warm water, which could be moderated at pleasure when required. Suckers potted early in spring, and that have rooted to the sides of the pots, should be watered if they appear dry. All plunging material dependent for heat on its own fermentation should be narrowly watched, and if it indicates more than 90° , some means must be used to allow it to escape from the sides of the pots, otherwise the roots may suffer, and then all, in whatever stage, suffers too. Give the pots a shake, or bore some holes round them, and pour in a little water.

VINES.—Grapes thinned last month will now be swelling very fast, and should be encouraged with a temperature of 70° by night with a rise of 10° or 15° more by day with sun heat, maintain a thoroughly moist atmosphere by keeping the evaporating troughs full of water, and sprinkling the paths and walls, but avoid by all means raising a scalding steam by syringing pipes or flues when very much heated, and never syringe the fruit or foliage. Should red spider make its appearance, rub the pipes over with a mixture of sulphur and lime, allowing it to remain on the pipes for a few days. Thin the bunches and berries of free-setting Grapes as soon as ever the bloom is shed. Stop, disbud, and tie in succession vineries; and those now starting naturally should be encouraged with a little fire heat. Late houses should have the Vines slung down from the glass, and the house itself shaded in order to keep them at rest as long as possible. Early pot Vines will this month be arriving at the colouring point, and should have diminished atmospheric moisture, and a greater admission of air. Give every encouragement to Vines in pots intended for fruiting next season. Shift them on into pots a size larger, as they fill their pots with roots. Use a gritty rich soil mixed with some half-inch bones and a little charcoal. This is a good time to plant out permanent Vines. In doing so, shake them entirely out and plant near the surface of the border, "laying" in a foot or more of the stem of the Vines, from which roots will be freely emitted. Wherever the subsoil is damp and clayey, rich heavy borders should by all means be avoided, and if your border is such on a damp subsoil, add a quantity of road grit or coarse river sand to lighten it. Living and active roots with well ripened moderately strong wood is always the surest to yield plenty of plump bunches. As soon

as they are planted protect the border from drenching rains and cold winds, and keep the Vines at a low temperature.

PEACHES AND NECTARINES.—Where there has been an abundant set of these let them be thinned out, but always leave more than a crop till they be stoned. Disbud by degrees and leave very little more wood than will be required for another season's crop. Maintain a humid temperature of from 55° to 58° , and use the syringe freely morning and evening when the day is fine. Green-fly should be kept down by fumigation with tobacco smoke. Attend to former directions in regard to succession houses.

ORCHARD HOUSE.—Fruits that are set in this department should have more water at the root now, and be freely syringed. In pots fruit trees are sadly pestered withered spider, which must be kept in check with a liberal use of the syringe. A few hot bricks with some sulphur sprinkled over them, keeping the house quite close for a night or two will also tend to keep them in check. Give plenty of air on fine days, and range the temperature at 50° at night. For further directions see former calendars.

STRAWBERRIES IN POTS.—Where fruit are colouring, keep a rather dry atmosphere, with a good supply of air, in order to secure flavour. Cease to apply liquid manure at the root, as soon as they begin to colour. The Strawberry when swelling its fruit requires a high temperature, and from 65° to 70° at night should be maintained, with 10° more with sun-heat by day. When in bloom, keep the atmosphere dry, and the plants near the glass with a good supply of fresh air, but avoid currents of frosty air. Introduce succession plants under glass, according to the demand. Do not expose those from which fruit has been picked to the open air, till well hardened off; give them the protection of a cold pit for a time, as these are invaluable in open air plantations.

CUCUMBERS AND MELONS.—Cucumbers that have been planted out for a few weeks, will now be progressing with speed. Maintain a moist temperature of 70° to 75° by night. Give more or less air daily, according to the state of the weather; and take good care that they do not suffer for lack of moisture at the root. Stop at every joint after they reach the trellis, and as they advance, do not let the shoots nor foliage get crowded, or you will very soon get them out of a bearing condition. Sow for successive crops. Stop and mould up the early Melons as they advance. Grow with as little water at the root as possible. Sow and plant out successional crops of some approved sorts.

FLORISTS' FLOWERS.*

CINERARIAS.—The most forward will now be coming into bloom; to have well shaped plants tie out the principal shoots so as to keep the plants neat and uniform. The Cineraria gives always the most satisfaction when bloomed early—re-pot those for late flowering, and give all plenty of room, air, light, &c. A gentle syringe in the morning, once a week, to clear away any dust from the foliage will be found beneficial; when there is any appearance of mildew, dust with sulphur. Keep down greenfly by occasional fumigation. Give the most forward plants weak liquid manure; water occasionally of the same temperature as the house; remove decayed foliage, weeds, &c.

PANSIES.—Plant out into beds about the middle of the month or sooner, if the weather is favourable, those wintered in frames, seedlings, &c. Stir the surface of the soil in the beds of those planted in autumn, and fill up any vacancies; peg the plants down or have them otherwise secure against boisterous winds. Sow seed now.

PANSIES IN POTS.—As these will now begin to grow freely, be careful that they have all the light and air in fine weather, only avoid exposure to cold cutting winds, frost, &c.; all should now be shifted into their blooming pots as soon as possible.

CALCEOLARIAS will now be making rapid growth. Keep a sharp look-out for greenfly; if allowed to get a-head now, farewell to everything like a good

* By Mr J. Downie, of Downie & Laird.

bloom. Shift on young stock, keeping the plants well down in the pots, so as to bring the earth in the pots up to the lowermost leaves, this encourages the plants to throw out fresh rootlets from the stem. Continue to take off cuttings, these root readily at this season in gentle bottom heat; give air on all occasions when the weather is favourable. Pot off seedlings, &c.

PELARGONIUMS will now begin to make rapid growth. Pay every attention to the training, so that the plants may be kept neat and uniform, and let specimens have sufficient room, and be careful that none suffer from want of water. Give plenty of air in fine weather, but avoid everything like cold cutting winds by the side sashes. Keep the house rather warm at night, say about 45°, to any of the old plants that have a sickly or yellow appearance. Use clear weak manure water occasionally; keep down greenfly; remove all decayed foliage; and attend to cleanliness in every department. Shift on young plants; any that may be wanted for late bloomings should now be stopped.

DAHLIAS.—All the cuttings of the finer sorts should be got in this month; those will strike readily and make fine plants if shifted on and properly attended to afterwards. Roots of those sorts, of which few plants are wanted, should be started in heat; the floor of a vinery at work, or a gentle hot-bed answers the purpose well. When they are about 3 inches long divide the roots and pot them (give plenty of pot-room), these make fine strong plants to turn out into the borders for an early bloom. Sow seed towards the end of the month.

FUCHSIAS will now be making rapid growth; stop any that have a tendency to be long-jointed, so that the plants may be uniform and bushy. Grow them steadily on (but not too fast) in a moist, warm temperature; use the syringe freely. Stout cuttings, taken (now) from the old plants when about 3 inches long, potted and plunged in a gentle bottom heat, root freely, and if properly attended to afterwards, will make fine blooming plants this season.

HOLYHOCKS.—In frames, give all the air possible in fine weather by removing the lights; if this is not attended to, they are apt to throw up flower spikes prematurely; continue to put in cuttings and re-pot those struck, using a rich light soil. Plant out about the end of this month, let the pots be kept beside them for some time after planting, so that they may be protected should a sudden night's frost or wind set in.

BEDDING PLANTS.—Encourage the growth of such plants that a large supply of cuttings are wanted from; continue to put in cuttings of all that are likely to be required, and pot off those already struck. This is a good time to increase the stock of such Geraniums as Flower of the Day, Golden Chain, Mountain of Light, Unique—those strike more readily now than at any other period of the season.

AURICULAS.*—As these plants will now have made considerable growth, they will require to be regularly supplied with water. Keep cold cutting winds off, but give all the air possible to prevent them being drawn. So soon as the trusses appear, some protection will be necessary to save the pips being crippled by frost; an old carpet next the glass, and a mat over, will serve the purpose—remove these early in the morning. When plants throw up two flower stems, allow the side stem to remain for bloom, and pinch off the centre one. The only true blooms are obtained from the side stem. Attend to cleanliness, and turn the pots as needed. When disease gets into a collection, this is the time that it generally exhibits itself. When the neck of a plant leans to one side, remove the soil from the part, and examine it; should there be rot, cut away the infected part, and dress the part with charcoal powder. Allow it to remain exposed to the action of the atmosphere till thoroughly dry, before covering the part with new soil. Should the interior leaves of a plant look fresh, while the exterior are flaccid, and refuse to grow, take the plant out of the pot, when it will be found that the end of the stem or tap-root is in a state of decay. The only

* By Mr G. Lightbody, Falkirk.

chance to save a plant in this state is to cut into the sound portion of the stem, expose it to sun and air till well dried, then re-pot in a smaller pot—using for this purpose only loam and leaf-mould, with plenty of sand among it to keep it open.

TULIPS.—Allow no moisture to lodge in the caps of the foliage; during the month keep the beds for show in as dry a state as possible. Shelter the plants from cutting winds; protect from frost and hail. When the surface soil is in a dry state, stir it to the depth of an inch or so with a garden spade, or a large carving fork will answer the purpose.

CARNATIONS AND PICOTEEES.—These plants have stood the winter very badly, having been rendered too succulent by the prolonged humid state of the weather last autumn, and the want of sun to harden the fibre. Those that were badly rooted have generally given way. Great caution will require to be exercised during this trying month. Water cautiously, and do it in the morning. In the event of severe frost, use the precaution of a mat or two over the glass, till such time as the store pots are well filled with fibres. Clean the plants from decaying leaves; give plenty of air during mild weather, but protect from cold cutting winds. Turn the compost occasionally, and have it in a fit state for use next month. Examine well for wire-worm, grubs, &c., while doing so.

RANUNCULUS.—Plant any that may remain unplanted, according to the directions given last month. Look over the beds occasionally, and observe whether any of the roots have been thrown out by worms. Keep the worms in check by the application of lime water poured into their runs; fill up the holes with some dry soil. Allow no cracks on the surface of the beds. In the event of a severe frost, while the soil is saturated, a few old mats spread over the surface at night, will protect the tubers from any danger.

PINKS.—These plants will now be showing symptoms of revival. See that their roots are well in the ground. So soon as the surface soil is dry, stir it well about the plants. Allow no weeds. Should the weather prove genial, at the end of the month replace all losses from the spare bed, or from plants wintered in pots. Take care and lift with a good ball, and when wintered in pots, plant with the ball of fibres entire. When the bed is complete, give a top-dressing of old horse dung—one inch in thickness—over the whole bed.

NOTICES TO CORRESPONDENTS.

R. W. WILSON.—Lose no time in getting your Roses pruned, the Moss and French varieties require rather close pruning, especially if large flowers are wanted for exhibition. Fork in among your plants a good portion of well decomposed manure.

P. N., Dunoon.—The curl on the leaves of your Calceolarias is caused by greenfly; remove all the decayed foliage and fumigate with tobacco paper.

G. GORDON.—Delphinium Belle Alliance is quite distinct from Formosum. As they are both fine, it is a matter of taste to say which is best, we would say Formosum. Hendersonii does not come true from seed.

D. G.—The most simple and economical plan for heating such a greenhouse as yours is the common flue,

J. BOWYER, Belfast.—The following compost is very suitable for Pansies in pots, viz., two-thirds fibrous loam, one-third well decomposed dung and leaf mould, with a little sand, all well mixed together but not sifted.

PLANTS IN A VINERY.—I have a number of plants which will not do to be kept in the greenhouse during winter, it being too cold for them, and I keep them in the vinery; how warm, for the sake of those plants, may I keep the vinery without doing injury to the Vines? An answer to this in the next number of the *Scottish Gardener* will very much oblige.—A GREENHORN.—The Vines will not suffer if they are kept at a maximum temperature of 45° during the winter.

THE SCOTTISH GARDENER.

THE BEAUTY OF NATURE IN RELATION TO LANDSCAPE GARDENING.

No. 2.

IN a former paper, we said that, there are three things, which, in investigations of this kind, are to be carefully discriminated :—(1), The emotions awakened by the Beautiful; (2), The mental acts or states which connect the emotions with external objects; and (3), The characters or qualities of outward things which are the objects of the mental cognitions, and the causes or occasions of the pleasurable emotions. The third point is our proper subject; but we proposed to make a few remarks, by way of introduction, on the first and second. The first we have already discussed, very imperfectly, it must be owned, but with such extension as was permitted by our narrow limits. We come now, with similar brevity, to make a few observations on the mental link, which connects our emotions of Beauty with the external world.

A recent writer, in allusion to the structure of the eye, graphically calls the function of mind, in this matter, the intellectual lens by which the light of beauty is thrown upon the moral retina, or as we would rather say, on the emotional sensibilities. We cannot agree with Mr Ruskin, that, our aesthetic emotions are altogether moral, though they partake somewhat of that character. That beauty is not virtue is proved by a thousand mournful facts in the lives of artists and poets.

It was formerly remarked that certain colours and sounds have such a relation to the human organism, that they invariably afford pleasure. The sensations produced by these are the original elements of beauty, or at least they come first in point of time. It is important to observe, that these sensations are intellectual states,

as well as corporeal affections. Materialists indeed will have it, that sensations are nothing more than impressions on the bodily organs; but all those, who hold the distinctive subsistence of mind, also hold that sensations in one of their twofold aspects are affections of mind. According to the late Sir William Hamilton—unquestionably the greatest metaphysician of recent times—sensations such as those of colour, are always accompanied with mental apperception, that is, with a cognition by the mind of the state produced in it. This intellectual process is so simple and so universal, that we will not, and need not, make it the subject of lengthened disquisition. We may, however, remark in passing, that this obscure region of our nature has been the *champ clos*, the chosen battle-field of the Realist and the Idealist, and that there they have tilted about the existence of the external world. The student of the Beautiful will not intermingle with these dizzy conflicts. He will say with Goethe—"Stand out of my way and let me look at the world whose existence you are discussing!" And he may safely use this language, for he may assure himself, that the consciousness gives as certain a report about the Not-Me, as about the Me—that is, its evidence is as strong in favour of the world without, as the world within.

The concern which the intellect has in our sensations is shown by the power which attention exercises over them. Flavours of sapid bodies, for example, the first time they are tasted, or when they are presented to an inexperienced palate, will be helplessly confounded, or will become the subjects of capricious preferences or dislikes, but they are at once distinguished and appreciated correctly by those who are accustomed to them. A judge of wines will discriminate a hundred variations of bouquet and flavour, indiscernable by those who have had no practice in that way. So is it with most of our other sensations; and this influence exerted over them by attention, which is intellect directed by will, clearly demonstrates that they are within the sphere of mind.

The same conclusion comes out, in a different way, when we investigate the nature of our perceptions of form. Let the eye of a person, within doors, be casually directed to a window, through which the daylight is streaming; it is known that an image of the whole window, be it oblong, square, or round, is projected on the retina—and there is a general impression produced by it on the sense of sight; but it is only when the attention is directed to its outline, and the several parts successively are compared with each other, and with the whole, that we can say, that is oblong, square, or round. The perception of form, even in small objects, is in fact the perception of the relations of the several points in the outlines, and that is a purely intellectual act. This principle becomes clear when we consciously contemplate any large object—at such distance that we can see the whole of it at once—such as an isolated castle, a mountain like Benlomond, or one of those *cumulus* clouds which sail about in serene spring weather. The attention

leads the eye leisurely around it, observes all its bounding lines and curves, and salient and re-entrant angles, and at length apprehends its form as the total result. Or let a spectator survey a beautiful prospect, such as that which is seen from the battlements of Stirling Castle, looking westward. The whole landscape is depicted at once on the little circle of the retina, as one may see by inspecting his neighbour's eye. In this case, also, there is an immediate and total impression, but it is only gradually that the attention can take possession of the details—the richly cultivated plain intersected by shining streams in the foreground—the dim heathy hills on the right and left—and the blue mountains in the far distance. No one who has any belief in mind will doubt its operation in such cases as these.

Hitherto we have spoken of the action of the intellect in the apprehension of outward things, without regard to the character of these things, that is, whether they are beautiful or otherwise; but it is not to be doubted that much pleasurable emotion is derived from the workings of the intellect, in regard to external nature, and that it shapes out no small amount of beauty for itself. Without giving an unqualified assent to the affirmation in the oft-quoted lines of Akenside:—

Mind, mind alone (bear witness, earth and heaven !)
The living fountains in itself contains
Of beauteous and sublime.

We would rather think with the calmer and more philosophic Wordsworth:—

Of mountains, and of all that we behold,
From this green earth; of all the mighty world
Of eye and ear, both what they half create
And what perceive.

Were it not to anticipate what we have afterwards to say in our remarks on Objective Beauty, we might find abundant corroboration of this principle in the higher characters of fine scenery. Let us instance the qualities of Unity and Variety, whether as considered apart, or as unitedly forming the "*il piu nell' uno*" the manifold in the one, assigned by Italian painters as the very essence of Beauty. The Unity can scarcely be said to exist in Nature, except in the mere contiguity of the objects in space; but the mind of the observer remarks, or unconsciously feels, the absence of discordant features, blends together its successive impressions, and so composes that harmony of effects which constitutes a real unity. So in Variety, there is a mental reference to the co-relation of parts, a perception of differences in the component elements of the scene, yet differences so co-ordinated as to make up a pleasing whole. Without doubt the diversities exist in Nature, but it is only as perceived by the shaping intellect, that they yield the emotion of pleasure, and establish the character of Beauty. What is called Expression in landscape is, if possible, still more dependent on mind, and on the culture which it has undergone. It consists, in fact, in the inward feelings throwing

themselves out on external things, not arbitrarily indeed, or on any chance object, but on what is fitted to awaken them and call them forth. There are few who are not alive to the difference of impression yielded by a broad level champaign covered with waving grain, a brown heath spotted by a few scattered sheep, a picturesque grassy valley interspersed with Hawthorn bushes and other copsewood, and an extensive range of mountain ridges lifting up their hoary summits towards heaven. In the presence of such scenery, we speak, as it may be, of the interesting, the dull, the sombre, the beautiful, the sublime, and so on, epithets which all denote phases of projected emotion, but which also imply characters outwardly existing by which the corresponding emotions are evoked. Most true it is in these circumstances that the working intelligence "half creates and half perceives."

This brings us to notice the influence of Association on Beauty—an influence which we are very far from denying, while we assert the originality of the pleasing emotions, directly obtained from the sensations of colour, form, and sound. The immediate sequence, we might almost say the co-sequence of one idea on another, and the co-existence of an emotion with an idea, and various other connections, however casual at first, when they have once taken place, are often ready to re-produce themselves. This is the combining principle of those infinitely diversified trains of thought, which pass through the minds of different persons, or even of the same individual. Those who have paid any attention to their inward nature are aware that their thoughts may be in one moment in Edinburgh, in the next at Jerusalem, and in a third in China or at the ends of the earth. There is a real concatenation of idea, whatever it may be, in these huge flights over land and sea. The general laws of Association or Suggestion, as it is sometimes called, may be found in the ordinary and well-known treatises on the Philosophy of the Human Mind. As we are not ambitious of writing metaphysics, and yet would gladly afford to the uninitiated some insight into this wonderful principle of our nature, we copy the following examples of Association from two masterly writers. Dr Thomas Brown gives the following beautiful illustration :—

"The hill and the waterfall may be pleasing to every eye; but how doubly beautiful do they seem to the very heart of the expatriated Swiss, who almost looks, as he gazes on them, for the cottage of his home, half gleaming through the spray; as if they were the very hill and waterfall which had been the haunt of his youth. To the exile, in every situation, what landscape is so beautiful as that which recalls to him perhaps the bleakest and dreariest spot of the country, which he has not seen for many dismal years? The softest borders of the lake, the gentle eminences, that seem to rise only to slope into the delightful valleys between, the fields, the groves, the vineyards, in all their luxuriance, have no beauty to his eye. But let his glance fall on some rock that extends itself without one tuft of vegetation, or on some heath or morass of still more gloomy barrenness, and what was indifferent till then is indifference no more. There is an instant emotion at his heart, which, though others may scarcely conceive it to be that of beauty, is beauty to him; and it

is to this part of the scene that his waking eye most frequently turns, as it is it alone which he mingles in his dream with the well remembered scenery of other years.—LECT. liv.

The above is a good example of Association properly so called ; the following is rather one of Suggestion :—

“ Examine the nature of your own emotion (if you feel it) at the sight of the Alp, and you will find all the brightness of that emotion hanging, like dew on gossamer, on a curious web of subtle fancy and imperfect knowledge. First, you have a vague idea of its size, coupled with wonder at the work of the great Builder of its walls and foundations—then an apprehension of its eternity, a pathetic sense of its perpetualness, and your own transiency, as of the grass upon its sides ; then, and in this very sadness, a sense of strange companionship with past generations in seeing what they saw. They did not see the clouds that are floating over your head ; nor the cottage wall on the other side of the field ; nor the road by which you are travelling. But they saw *that* (The Alp). The wall of granite in the heavens was the same to them as to you. They have ceased to look on it ; you will soon cease to look also, and the granite wall will be for others. Then, mingled with these more solemn imaginations, come the understandings of the gifts and glories of the Alps, the fancying forth of all the fountains that well from its rocky walls, and strong rivers that are born out of its ice, and of all the pleasant valleys that wind between its cliffs, and all the chalets that gleam among its clouds, and happy farmsteads couched upon its pastures ; while together with the thoughts of these, rise strange sympathies with all the unknown of human life, and happiness, and death, signified by that narrow white flame of the everlasting snow, seen so far in the morning sky.”—*Ruskin's Modern Painters*, Vol. iii., p. 136.

Perhaps it may grate on the reader's feeling of admiration of the latter singularly eloquent extract, to be told that the Alp which suggested it was only an imaginary one, only, in short, the glass-roof of a workshop “ rising above the nearer houses, and rendered aerial and indistinct by some pure blue smoke which rose from intervening chimneys.” The fact, however, is valuable, as it shows that a visible object may be only the occasion of trains of thought which lead to the most exquisite emotion. Both extracts afford admirable illustrations of these mediating trains, that is, of the links which connect the objects seen with the sentiment of beauty. It will be readily remarked how the theory of association accounts for the different degrees of pleasure derived by different persons from the same scenery. All may be pleased ; but hardly one may have the same vividness of emotion as another. Of course, the more delicate are the senses, and the more refined the associations, the more exquisite will be the pleasure derived from beautiful objects.

Adverting to practical hints to be deduced from the foregoing considerations, it may be remarked that as the field of Association is in the mind itself, and its occasions or excitements are all that are without us, the concern of a Designer with it, in laying out grounds is mostly of a negative kind. He will avoid or conceal what is fitted to suggest offensive ideas. In other respects, he can only arrange his materials so as to meet the average associations of cultivated men. With regard to the internal culture of the mind itself, it is his privilege, in common with the better portions of his race, to habituate

his mind to those trains of thought which may be characterised as partaking of the good, the true, the cheerful, and the beautiful. It is a great misfortune to have ideas that spontaneously gravitate towards what is base, ugly, grotesque, vicious, and dishonourable.

The education of the intellectual and emotional nature relative to Beauty is a subject of great importance; but it is of too great extent to be undertaken at length at present. Character has been defined by a German writer as an educated will: and so a refined taste is educated intellect and feeling relatively to the Beautiful. It is true that there is a natural taste, just as there is a natural character; but neither of them is untrained, though the training may have been left to fortuitous circumstances, and, therefore, the results may be much less felicitous than they might have been. Even sensations may be so cultivated as to acquire an almost incredible delicacy. It is said that a musician with an accurate ear can distinguish the 1-80th part of an interval between two consecutive notes in the musical scale. We suppose that the painters Turner and Etty observed shades of colour that were hardly ever seen by other mortal eyes. Part of that delicacy of sensation was no doubt owing to innate sensibility; but part of it also must have been due to continued and earnest culture. Hence the stress laid by Payne Knight on what he calls "improved perception." Hence, too, the importance justly attached by Price to the study of pictures. An experienced practitioner in landscape gardening has, without doubt, a mastery in composition, to which a person who has not studied the contrasts and harmonies of colours, the forms of trees, the effects of grouping, and the contours of ground and various other kindred matters, will in vain aspire. All young gardeners who wish to rise above the mechanical part of their profession should practise drawing—an art which will educate both their eye and their hand. Mr Ruskin would have it taught to all without exception. "This art of drawing," he says, "which is of more real importance to the human race than that of writing (because people can hardly draw anything without being of some use both to themselves and others, and can hardly write anything without wasting their own time and that of others),—this art of drawing, I say, which on plain and stern system should be taught to every child just as writing is,—has been so neglected and abused, that there is not one man in a thousand, even of its professed teachers, who knows its first principles." We do not concur with Mr R. in thus undervaluing the art of writing. His attention seems to have been engrossed with the abuse and excess of scribbling for the press; while he has overlooked epistolary correspondence, one of the privileges, and the keeping of accounts one of the duties of civilization. We cordially agree with him, however, in wishing that the art of drawing was more extensively taught, particularly to gardeners and others who have anything to do with drawing or executing works of design. At the same time, it is

possible to carry artistic education too far, or at least to the establishment of artificial and fictitious standards of judging and acting. Professional training often unfits for everything beyond its particular object. Mr Ruskin himself says that poets are generally bad judges of pictures; their imaginations taking fire at the first glance, and hurrying them away from the perception of the more latent graces. The late Sir Thomas Dick Lauder, who was a draughtsman of considerable skill, and a man well acquainted with painters, remarks: "From my own knowledge, I can say that, however valuable the study of pictures may be for giving perfection to professors of landscape gardening, the painting of them does not always produce this effect. Artists, and especially young artists, have, not unfrequently, their tastes so much narrowed by their devotion to certain styles of subject, as to be incapable of enjoying, or even of tolerating anything in nature, however excellent it may be, if it be of a different character from that which they affect in their works."—*Lauder's Price on the Picturesque*, p. 66.

HOW TO RENEW VINES AND VINE BORDERS AND NOT LOSE A CROP OF GRAPES.

BY MR D. THOMSON, DYRHAM, HERTS.

How frequently we meet with an expressed anxiety, on the part of gardeners whose accommodation for the growth of Grapes is limited, to do away with sickly and unfruitful Vines, make new borders, and plant young Vines. But this necessary and desired operation is not unfrequently put off from one season to another, just because the loss of the crop from the old Vines, scanty though it may be, cannot be afforded. The question which at once presents itself to the mind in this case is—Is the loss of a crop, even for one season, unavoidable? I would emphatically answer this question in the negative, and go so far as to say that in cases not a few, the operation may be performed so as not only not to lose a crop of Grapes, but, on the contrary, to be a gainer. It is a common proverb that more is got by scheming than by hard work. In this instance let us combine the two, and the end in view will be gained successfully.

I will suppose that your earliest vinery is in a bad state, and that you desire to make a new border and plant young Vines. Decide to do so next year, and in the meantime prepare twice as many Vines as there are rafters in the vinery; or say, if there are nine rafters, grow 24 pot Vines, and then you will have a few to choose from. A small pit and the odd corners of your vineries, will easily accommodate and grow this number well. Suppose next, that autumn has arrived, and your old Vines are leafless—prune them as soon as ever the motion of the sap ceases, and in so doing, leave three eyes instead of pruning them closely in to the old spur; being old and weak, there will thus be more chances of a crop than if pruned

closely. Start them with a little fire-heat by the 1st of December, and if a bed of fermenting material can be had inside the house all the better. As soon as they get the length of showing fruit, and are ready to disbud, introduce the pot Vines to the coolest part of the vinery, and coil them a little till they break, and then fix one in the middle of each light at top and bottom of the house. Here, now, you have two strings to your bow, and what you will not have one way you will have another. As will be seen, it is desirable to have the old Vines earlier than those in pots, so that the former can be got rid of first, and as soon as possible.

If started at the time directed above, the grapes from the old Vines may be all cut by the 1st of June, when, of course, these Vines can be cut out; and, having all in readiness for the new border, get that completed in the shortest possible time, and if done by the middle of June, there is an excellent season for the strong growth and maturing of young Vines. The Vines with which this border is intended to be planted, should be planted in bushel hampers and brought on very slowly till the border is ready for them. If grown in a sort of intermediate house after the 1st of April, all the better. In planting them, place them where they are to be in the border, and cut the hampers away from their roots without breaking the balls. If there are any fruit still to cut from any of the pot Vines, remove them to some other house, and push on the Vines now planted with a high temperature and a moist atmosphere, and they will very soon reach the top of the house, and by the end of September, all things being favourable, they will be splendid canes. But what about my crop for 1859? am I to get *all* my crop from these Vines? Certainly not. By planting two Vines to a light instead of one, and by the aid of a dozen or more pot Vines, your case is fully met. The Vines intended to be permanent, should be cut down to the front sash; the other left to bear a crop, say half way up the roof at the least, and the pots will clothe the top part, and here is a re-furnished vinery, with no loss, rather the reverse. And to those who prefer the long young rod system of cropping Vines, I might suggest, that instead of doing away with either of the two Vines planted to each light, that it is well worth while considering whether it would not be wise to retain both, and cut the one down while the other is left to bear, thus avoiding the heavy work of having a rod in full crop, while at the same time the same roots are supplying the support necessary to insure a strong cane the whole length of the roof. Although I have never practised this plan, I think of doing so, and feel confident that it will answer better than making one plant swell a crop of fruit, and make so much young wood at the same time.

By this method of renewing vineries, I once saw a crop taken from the old Vines, and the house planted on the 1st of July with Muscats, and these ran to the top of a long rafter, and made famous canes by the end of September; and I have this season adopted the

plan I have described; and though the old Vines were so "far through" that they did not "show" worth leaving at all, I have double the crop from pot Vines that I could have had from the old ones under the most favourable treatment. To each rafter I have, about a fortnight ago, planted two Muscats, and next season I intend taking a crop from Hambro's in pots before I introduce the Muscats into heat. I intend cropping every alternate rod of the Muscats, so that with some pot Vines at the top of the house there will be two crops the same season instead of losing one.

HARDY FRUITS IN GENERAL—AS TO CLIMATE, LOCALITY, &c.

BY MR R. ERRINGTON, OULTON PARK, TARPORLEY.

THE readers of the *Scottish Gardener* are doubtless but too well aware of the unsatisfactory character of many fruits which bear high sounding names, and are said to attain great perfection in certain parts of the United Kingdom. That we have all something to learn as to the various influences by which fruits are improved or deteriorated both in size and quality, the most experienced person in the Kingdom would, I am assured, be the first to admit; but, whilst we admit this, we may boldly aver, that much very valuable knowledge is already available that is not generally brought into play. It is my purpose here so to examine the case in hand, as not only to throw some light into the darker recesses of this matter, but also to induce a spirit of investigation. Now, this contrariety in results applies both to flavour and size; and to these we may add general appearance—for we may not altogether slight the decorative character of fruits, if such can be obtained without derogating from their flavour. But colour and quality not unfrequently go together—as an instance, I would name the Beurre Diel Pear; this, in the north, is apt to prove a huge, coarse-grained, dull, greenish-brown Pear; but to read the accounts given of this fruit in the *Gardeners' Chronicle*, or elsewhere, we may find that, as exhibited, it has been most beautiful in colouring, as well as melting in character;—such I think has been stated as the case with those grown at Heckfield House by that clever gardener, Mr Tillyard. And not only do the qualities of fruits differ, but their bearing properties also; and here the question before us assumes two distinct forms, and gives rise to the following questions—1st. What are those congenial conditions which so much influence the flavour and appearance of fruits? and next, What promotes fructiferous tendencies?

We must at once consider that this is not a mere question of a degree or two of latitude. I have heard of an amount of success with certain somewhat tender Pears, &c., in almost the heart

of Scotland, which is not dreamed of in such counties as Stafford, Lancaster, or York in England. We must therefore look farther than the mere latitude of a place as to the causes of success. It is astonishing to reflect what a vast difference in regard of climate exists in gardens situated within a few miles of each other; not alone in the precocity of their fruits or vegetables, but also in the amount of success in fruit culture. Thus, take a garden in a valley where the soil is a sort of alluvium of two or more feet in depth, and the subsoil, as is frequently the case, a clay or some retentive material; and this in a locality where fogs and mists accumulate, and are not easily dispersed: here, of course, the fruit trees will be plagued with excess of moisture, both above and below. Then let us take another case—a garden within half a score miles, but on the side of a hill; the soil a friable loam, as very often happens, and the subsoil gravel, or an open material; where the vapours will be speedily dispersed, and the trees enjoy immunity from excess of moisture, whether of soil or the atmosphere. What really good gardener would expect similar results from these two gardens? And if the gardener in the valley, in pursuance of old but erroneous practice, had made what are called rich borders for his fruit trees, it is surely easy to discover that his trees would be a perpetual plague, through the abundance of young spray they would produce. Need I add, that it is vain to look for good crops of good fruit where trees are choked with watery spray.

If these things be a fair illustration of the subject, with what caution and a knowledge of principles should any person set about planting a garden with fruit trees. Of course my remarks do not refer so much to orchard planting, as to the more tender dwarfs or trained trees. I may now advert to the wall trees in kitchen gardens: here we shall very frequently find another source of failure in the trees being placed in wrong or unworthy aspects. Much error is propagated in this way by catalogues, some of which give such glowing and unqualified recommendations, as have a constant tendency to mislead; too little regard being paid to the vast difference in climates; so much so, that even practical men are not unfrequently misled by them. For instance, to give a case or two in a catalogue now before me. "*Beurre d'Aremberg* does capital on Quince Stocks, and bears well as an espalier or by pyramidal training." Now this is given without reference to climate; and as such catalogues profess to inform the United Kingdom, there is no reason why a gardener at John o' Groat's and another in the county of Kent should not be planting a pyramid *d'Aremberg* each on the same day, and chuckling alike over prospective matters. Again, the winter *Neilis*, one of our most tender Pears, and well deserving as good a situation as the Peach anywhere in the north. Here we have a similar description from another catalogue. "*Excellent Flemish Pear*, hardy, &c. Wall or standard," &c., &c. I wonder how

many counties in England and Scotland produce the winter Neillis in perfection on a standard?

The fact is, there is great need of a sound book on fruits; but such to be a safe guide, should be written by a man of broad views and of great experience in his profession. It could not be expected that perfect information on every matter could be afforded; but such a guide could furnish such information as would prove of vast assistance to the uninformed, and would be divested of the charge of bias which, as we all know, necessarily attaches in some degree to mere trade lists. However, I will return to the main purpose I had in offering these remarks, and endeavour to draw attention to the various considerations which attach themselves of necessity to this question.

Here I would point to one feature in the culture of tender fruits, which concerns the whole Kingdom, but more especially gardeners north of the Tweed. We all know that what are called tender fruits have exceedingly multiplied during the last score years, and that the tempting titles and recommendations of many of our finer Flemish Pears threaten in no small degree to banish some of our wall Peaches and Nectarines, in order to make way for these delicate strangers. Indeed it really amounts to this, or else to build new walls for them: the latter, few will, or indeed can do; and the consideration of this forces the question into a narrower compass. Hence it is plain, that it is of the highest importance to be very particular as to the kinds we select. I will boldly affirm, that in Pears, taking any of our most extended catalogues, scarcely one-sixth part of those fine titled things will be found to suit the gardens of Britain. That they are many of them good in such climates as Belgium, and some other favoured parts of the Continent, may be true; and that many are worth trial in the very extensive establishments of the higher orders of society—especially in the warmer counties, may be equally true; but this constitutes no rule to the average of British gardens—less favoured by climate and by circumstances.

Before concluding these remarks I would respectfully offer a little sound advice as to the mode of planting tender fruits. After forty years' close practice, and as close an observation of the fruit question, I feel I may venture to do this without the charge of presumption. One of the chief errors attached to the culture of tender fruits in cold or damp districts, is the planting the trees too low, and in making the soil too deep or too rich, or both. There can be no doubt that, on a principle, trees should be elevated in proportion to the increased chances of moisture. Here, let it be remembered, that there are two distinct ways in which moisture may prove injurious, and either of them, or both combined, may be found in many situations. I allude here to excess of moisture in the soil and subsoil, and too much air moisture; the latter worse than the former, inasmuch as we can drain soils as we please; but who can drain the atmosphere? I have known cases where many of our common vegetables possess nearly twice the height and bulk of foliage that they do under

ordinary circumstances ; and have heard a man of veracity affirm that he had seen the common Broad Bean six feet high and more, with foliage in proportion, in the neighbourhood of Enniskillen, county Fermanagh, Ireland. Here we see the effects of a superabundance of air moisture over-head, with doubtless misapplied manurial matters beneath ; and just in this way are fruit trees influenced ; thus we have the constant outcry of " my trees produce little but wild shoots, and what fruit they do produce, is both watery and insipid."

Now, as to depth of soil, I am prepared to contend, that if one-third of the volume of the soil is above the ordinary ground level, a tree will enjoy some 30 inches in depth of sound soil ; but to carry the soil deeper downwards, and thus induce the roots down to a lower level, will prove in the majority of cases a grave error. Such being admitted, it becomes manifest, that by my suggestion as above, 10 inches of roots extra at a high level are obtained ; and these in a position to freely enjoy all the ameliorating influences of the atmosphere. The ripening of the wood, although to some it may appear a mere cuckoo cry, is the grand basis on which to build all prospects of successful fruit culture. It may safely be affirmed, that he who best secures this object, will prove by far the most successful fruit grower ; thus, how necessary it becomes to secure all those conditions on which that result depends.

What is called platform planting, of which I claim to be the originator, is the safest course of any ; and I heartily wish I could persuade all to adopt it. I have been constantly urging this in our various gardening periodicals for the last score years ; and as to the propriety of the high culture of surface roots, and the avoidance of rich soils, papers by me may be found in *Loudon's Magazine*, at least twenty-six years since. Strange it is, that although the principles there enunciated have never yet met with an open foe of any consideration, yet how few may be found, who, having as it were recognised the facts, have ventured to carry them fully out in practice. I here beg to recommend them once more to the earnest consideration of all Scottish gardeners, who as a body are by no means slow to appreciate sound views. The Scottish climate in the main is such as to need every skilful appliance.

THE ROSE CONTROVERSY.

THE discussion about Roses new and old, to which we alluded in our January Number, has been carried on, more particularly in the pages of the *Gardeners' Chronicle*, with much animation, and we regret to say, with some acrimony, and imputation of motive. Roses appear to be a prickly subject. The main grievance is, that the Rose nurserymen paint their favourites too much in *couleur de Rose* at first. It is rather strange that the same allowance is not made,

in the case of Rose catalogues, which is made relative to all other catalogues of articles for sale. When a leading publisher sends forth a list of books, interspersed with laudatory extracts from reviews weekly, monthly, and quarterly, it betokens great simplicity not to make a considerable deduction on the ground of puff direct, indirect, or implied. When a man has to make up his mind as to an American churn, he generally lets the froth of cream and words subside, before he holds that he has ascertained the nett action of the machine. Messrs Rendle in their *Price Current* and Messrs Sutton in their *Spring Catalogue and Amateurs' Guide*,—admirable and instructive compilations, whose only fault is their fulness—mostly print the names of seeds or other articles of their own growth in capital letters, or in other ways of typographical emphasis; but it cannot be supposed that these excellent persons mean to affirm that “our Pea,” or “this Turnip which we were the first to bring into notice,” stands to other Peas and Turnips in the same relation as capitals do to small letters. A little knowledge of seeds and plants combined with a little knowledge of human nature, makes all that square and right. Why should not the same principle be applied to Rose catalogues? Upon the whole, they are as fair and honest as any similar documents that are going.

Mr W. Paul makes a very sensible proposal to the grumblers, when he says “come to the nurseries and inspect the Roses yourselves, and then make your selection.” Nothing can be fairer than this plan; but it is not quite free from disadvantages. “Notwithstanding the help of railways, it may be inconvenient or expensive for me to go all the way to Cheshunt; or I cannot go this summer, and therefore I cannot choose from among the novelties introduced last spring; but I am preparing to exhibit Roses at next year’s show at Blankham, County of Blanks, and if I cannot get something new, I fear I shall cut a poor figure.” My friend, there is no other help for you; you must either go to the Rose nursery, or be content with the Rose catalogue. And why should you not be satisfied with the latter? Why not go upon evidence, such as is found sufficient by the fanciers of Dahlias and Pelargoniums?

In the south, there seems to be a ridiculous desire to have seedling flowers and fruits pronounced “good” by some judges supposed infallible: and if the judge aforesaid declares oracularly “your Fuchsia is first-rate,” or “your Dahlia is perfect in its class,” the response, as if it had come from Delphi, is converted into a puff, and is trumpeted forth in every possible way. Our readers may be assured that it is far less safe to trust opinions like these, than to accept of the modest statements of the Rose growers made on their own responsibility. We have long thought that in this respect floriculture is getting into an unhealthy artificial state. Many people seem to be afraid to admire, till they are told how and what they are to admire. Mr Glenný, and perhaps some others, have published canons of floral criticism; and have set forth

at length the properties of first-rate Auriculas, Dahlias, &c. These canons may save people the trouble of thinking about flowers ; and they may serve as rules to silence murmurs at flower shows, just as an appeal to Hoyle is convenient in settling disputes about whist. We have no wish, however, to see them carried any further or even so far as they have been. Only imagine Mr Rivers gravely inditing that, according to canon 1, Prince Leon is of perfect shape ; that, in virtue of canon 2, Lord Raglan is of excellent colour ; and that, in terms of canon 3, Robin Hood is of most graceful efflorescence. What abominable pedantry would this be ! We stand up for the right of private judgment. In Scotland, at least, the canon law has no validity. We will allow no more authority to the decrees of Pope Glenney, or Cardinal Beaton, or of Doctor Irrefragable, than to the False Decretals of Isidore.

Prospectively Rose catalogues are something of the nature of oracles ; but retrospectively they become subjects of criticism. After we have got the Roses, we compare them with the descriptions ; and it must be owned, generally find them better than they are said to be. It is next to impossible to paint Roses in words. By-and-bye the Rose-fancier has his favourites ; and he is a little jealous of the treatment they receive from those who undertake to characterise them to the public. We remember feeling dissatisfied when Mr Rivers omitted in his catalogue such Roses as Billiard, Blanche-fleur, and Brennus ; and were not a little pleased when his own taste, or the public demand restored them to their former places. In this respect there is a curious distinction between Roses and Dahlias. Of the latter flower, perhaps a score or two of new varieties appear annually, at half a guinea each ; in a couple of years they are down to a shilling, and in a few years more they disappear from the gardens. The above-mentioned Roses have been standing favourites for nearly 30 years ; and we trust they shall continue so, till, according to the vaticinations of Mr Rivers, the Summer Roses shall be among the things that were ; that is not in our time as we hope. The present controversy is a striking illustration of the feeling to which we are alluding. Mr Rivers, in shortening his lists, as he does annually, had relegated William Jesse and some others into his awkward squad. This produced "The War of the Roses" in the *Florist*, not the *Midland*, as was incorrectly stated in our January Number. Then followed a rush into print of Rose-growers, from all quarters, in defence of their favourites. Lists of old and improved Roses were given ; and these have manifested a great unanimity of judgment. Clearly we do not need canons in this department of floriculture. At the same time, while we rejoice in the manifestation of so much taste and zeal, we humbly submit that the citadel of floriculture is not even assailed, much less is it in danger of being taken. Mr Rivers, it seems, has vilipended William Jesse. Well : that does not oblige us to throw it away. Last summer we met with a specimen of this variety, which even Mr Rivers, had he seen

it, would probably have confessed to be the finest Rose plant he had ever witnessed. It was composed of a strong stem about $2\frac{1}{2}$ feet high, and a hemispherical head at least 2 feet diameter, finely balanced, and covered with Roses of large size, perfect shape, and exquisite colour. From that moment we booked William Jesse to be grown by us as long as we are able to grow a flower, all the dicta of all the Rose growers in the world notwithstanding. Most florists have their favourite flowers, and they have a right to have them. Mr Rivers very naturally continues to cultivate his George IV., which was the first seedling that he raised. For reasons, humbler, but quite satisfactory to ourselves, we keep La Tourtouville and L. Ingenue, though long dropped out of the catalogues, and we rejoice when serene weather induces the latter to expand its Camellia-like blossoms. It may be presumed, that many others indulge in this excusable favouritism, for though not a few florists have rushed, as we have said, into the pages of the *Gardeners' Chronicle*, yet they are but few compared with those who have preferred to please themselves in silence. Of late the contest has chiefly been between Mr Rivers and Mr W. Paul, and none are better entitled to present themselves as champions. Of course when Hector and Achilles come to blows, the rank and file should give them a wide berth. At the distance of 400 miles we deem ourselves safe from a chance hit, and we may venture to look on, and chronicle the battle, charitably hoping that no professional jealousy is permitted to exasperate the combatants.

Since the above remarks were written, the editor of the *Gardeners' Chronicle*, has proclaimed an armistice, so far as his columns are concerned, and has advised the belligerents to betake themselves to summer quarters. It was full time, for the paper pellets were falling "thick as autumnal leaves that strew the brooks in Vallombrosa." Some real results, however, have flowed from this written palaver, It has been ascertained that a certain Tea Rose, called Gloire de Dijon, can flourish north of the Trent, at York even, aye, farther than that, for like the peregrinations of the world-famous Peter Bell. the potter, its course has extended across the Tweed ;

And along the Lowlands fair,
All through the bonny shire of Ayr,
And far as Aberdeen.

Our English compatriots have curious notions about the climate of their "northern friends," as they call us. When we lived, many years ago, on the borders of Yorkshire, we had the utmost difficulty in convincing a friend that thistles grew to the height of two feet in Scotland. There was a Scottish grievance for you ! A more important point, however, has been established by the discussion, viz., that one man's experience in Rose growing cannot safely rule the procedure of another. This is well put in a recent number of the *Cottage Gardener* :—"There is not a man living who can tell the best 12 Roses for another man at a distance from him. All

that the most experienced can do, is to fix on such kinds as do well generally, and in most seasons: the rest must be determined by individual experience, each one for himself, on his own soil and locality; the locality has as much to do with this as the soil itself. Some seedlings of all our favourite plants go off very much after the first flush. Roses and Dahlias are notorious for that; therefore any Rose that has not been six years in cultivation cannot be said to have been proved for that country, county, or climate."—*Cottage Gardener*, Jan. 20, 1857, p. 279. Had these judicious remarks been duly adverted to, there might have been less asperity and fewer mistakes in the recent controversy.

But to return to our two principal combatants. Mr Rivers, it appears, had said in the *Florist* of last year, p. 329, that the new Roses sent out in 1855 had not cut a brilliant figure. This dictum led to the reclamations to which we have already alluded, and particularly to the publication of those lists of approved new sorts by Messrs W. Paul and C. Wood, which we partly copied in our January number. Mr Rivers admits (*Florist*, Jan., p. 15) that his statement was unguarded. "I ought to have added *but few of* (the new Roses of 1855) which gives the exact state of the case. I name but few, and their goodness cannot be disputed; for *Triomphe de l'Exposition*, *Arthur de Sansal*, *Ornement des Jardins*, *Triomphe d'Avranches*, *Mathurin Regnier*, *Bacchus*, and *Victor Trouillard* will hold their ground for some time." An approximation being thus made, in regard to facts, the question becomes mostly one of degree, and that leads to the other question whether Rose catalogues ought to be full or abridged. Mr Rivers holds it to be most expedient, both for the grower and the purchaser, that the catalogues should be short, and should contain only first-rate varieties. He complains that the recent novelties in the Hybrid Perpetual class are nearly all of Rose colour very slightly diversified; and he affirms that only five per cent. of the new sorts sent out in France of late years are worth cultivating.

To these averments Mr Paul replies that in the five years between 1848 and 1853, there were introduced 48 valuable varieties, the names of which he gives; and he continues, "I would ask what would our Rose gardens of the present day be without them? So good are they that they have become familiar in our mouths as household words, and I believe that there are as many good new Roses being gradually introduced now as then, although accompanied as then with shoals of rubbish."—*Gardeners' Chronicle*, Feb. 7, 1857. In the next number of the same journal, Mr Paul assigns his reasons for preferring an extended catalogue to an abridged one. His reasons which, we must say, seem to us to be perfectly conclusive, are substantially these:—1. Different climates require different sets of Roses—the south one set, the north another—the United States a third, the West Indies a fourth, and a nurseryman that aspires to supply the wants of English commerce, must grow them

all; and 2. Purchasers must be afforded a choice; they would no more allow a propagator to dictate the kinds they should grow, than a lady would permit a mercer to select the dresses which she should wear. Certainly the occupation of shopping would be gone, and very much to the dissatisfaction of our fair sisters, if a muslin warehouse contained only three patterns, even if these were the most elegant that human ingenuity could frame.

In the same number of the *Chronicle*, viz., Feb. 14, Mr Rivers has a letter partly in answer to Mr Paul, and partly in defence of his opinions generally, in which he gives certain favourite Roses a knock upon the head. He proposes some additions, which he says should be made to the paragraphic descriptions of Hybrid Perpetual Roses in his own and other catalogues. For example, Alexandrine Bachmeteff "flowers rather too flat;" Beranger, "flowers too flat;" Generals Bedeau, Brea, and Castellane, "delicate growers except in the richest soils." Oh! Mr Rivers, have you not said, for these three years at least, that the first is "very good," the second is "exactly like William Jesse, but more double, and perhaps larger," and have you not appended to the three Generals an asterisk, which according to your own explanation, is a mark for Roses that can be honestly recommended to those commencing their cultivation? Now, it seems, "all are stale, flat, and unprofitable." This is unquestionably candour itself. Mr R. disdains to avail himself of the apology suggested in the *Cottage Gardener*, as quoted above. "Too many (Roses) have been retained in our catalogues, with not exactly false, but what I may term smooth characters, such as are often given to indifferent servants to get them situations. I feel that I have 'oft offended' in this respect, but then one's eyes were blinded by novelty, and the fascination of a new Rose, so that describing its beauty under very favourable circumstances, its defects were for the time forgotten." So, Mr A. R., of Bromley, *habes confitentem reum*; here is one of the accused who pleads guilty to your indictment. Mr Rivers makes a clean breast of it. You will probably think with us, that the fascination which blinded for one year, need not have lasted three or four, and should not have ended in giving "a smooth character." We are humbly of opinion that Mr Paul's bearing is more dignified in this respect. Probably it is fairer, too, for it is hardly right for Mr R., when he gets tired of his own crusts, to throw dirt on his neighbour's bread and butter. For our part, we do not think the worse of a Rose because it is rather flat, or even semi-double; and while we regret the delicacy of the three French Generals, we suppose it possible to find a climate where they may flourish in vigour and beauty.

A point, which is perhaps more important than the merit of particular varieties, has emerged in the discussion. Mr Rivers is inclined to think that the acme of perfection has been reached in the Hybrid Perpetuals; and that little or no farther improvement can be expected. To this conclusion, which is not one that lovers of

Roses would willingly come to, Mr Paul demurs, and alleges, in disproof, the common philosophical maxim, that nature does not advance by leaps. To this, Mr Rivers, not having the fear of philosophers before his eyes, replies, that nature in certain circumstances does advance by leaps, and instances the Golden Pippin and Green Gage, &c., which, he says, were very great leaps. It must be owned that here the disputants, if strictly logical, are rather obscure in their reasoning. We presume Mr Paul means that nature, though she does not make large strides, may creep on a little farther in the improvement of Roses. Mr Rivers, we suppose, on the other hand, to say, that as nature made such a leap in the Green Gage as she has never been able to overpass, so she has probably leaped her farthest in the Prince Leon and Jules Margottin Roses. The reader will perceive that this is pure guess work on both sides. There is doubtless a limit to all improvement in material things. Our river steamers on the Clyde have been brought to sail at the rate of 18 miles an hour, but no one expects that they will ever rival the speed of express trains on the broad guage. But while there is undoubtedly a limit to all progress in this world, that limit is to be ascertained, not by *a priori* reasonings, but by slow experience. And we may suggest that Roses might be improved in other directions than that of beauty. Would it not be a great acquisition to have a Tea Devoniensis, or something like it, as hardy as the Ayrshire, or, at least, the Ruga? Twenty years ago, most of the Bourbons were "hard-headed" in Scotland,—i.e., scarcely ever opened, and were very poor when they did so; now there are many fine, free-blooming varieties in that section. We are disposed to believe that much might be done, in this way, were British nurserymen as diligent in sowing the seed, as in inserting the buds of Roses. We confess to a feeling of sadness when we hear Mr Rivers speaking of perfection being reached. Is he falling off from his first love? Have the more substantial qualities of the fruit garden quite captivated him? Horticulture owes him a large debt for the Orchard House, and root-pruning and his studies of Pears. Perhaps his outburst of candour about Roses is just a being "off with the old love, before he is on with the new." If this should be unfortunately the case, we would remind Mr Rivers of a promise made in the second edition of a work to which many have owed much of their knowledge and enthusiasm relative to Roses. "Perhaps when the hoar frost of age has powdered me more plentifully than at present, and when the cultivation of this favourite flower is followed more for my pleasure than my business, I may possibly again attempt to make a little book about Roses." We trust that the prophetic snows of age have fallen lightly on Mr R., and that they have done him much less mischief than the actual snows of last winter did in our rosaries; but surely the experience of thirty years must have imparted something else than fastidiousness of taste; and if he is really inclined to bid adieu to the growing of Roses, it would be a graceful farewell to unlock his stores of

treasured knowledge, and to tell his successors in the art what they should aim at, and what avoid.

We have felt more interest in this controversy than perhaps many of our readers will sympathise with. It has been maintained with much animation and with a little bitterness. Of course, we are not now referring particularly to the two main combatants, whose names we have mentioned above; they write like gentlemen. Mr Rivers even confesses poetical impulses, and were it not for the decay of interest, of which we have above expressed the fear, we might hope for another "Garden of Gul in her bloom," rivalling if not surpassing that of the Persian Saadi. Mr Paul expresses himself with a calmness and good taste, which some have not had culture enough to appreciate. For the rest, the dispute has been marked, as horticultural literature not unfrequently is, by an abundance of wit and dogmatism. One gets tired of wit, even in *Punch*; and while dogmatism is not to be admired or approved in the abstract, it is always well, when a man has got aught to say, that he should articulate it distinctly, even though he has not in his possession the whole truth.

HINTS TO AMATEURS ON ERECTING AND HEATING HORTICULTURAL BUILDINGS.

BY MR W. THOMSON, DALKEITH GARDENS, DALKEITH.

My communication under this heading in the January number of the *Scottish Gardener*, while it has induced several gentlemen to set about erecting such structures, has misled others, and in opposite directions; one class pronounce it impossible to heat a house 75 feet long, as described by me, for the sum I specify—i.e., £15; another class are disappointed because they cannot get three houses, each 25 feet long, heated separately for the same sum; to the former class let me say that I have erected a heating apparatus in a span roofed vinery 30 feet long, running a double row of pipe round both sides and one end, for less than £15. But to explain the matter clearer, I will give the items required for the orchard house. As the boiler has to be inserted under the ground level, at one end, and a syphon bend forms the return at the other, only 140 feet of pipe will be required, costing £7; the boiler £2, 10s; furnace doors and bars £1, 10s; bricklayer and bricks, for setting boiler, £1, 10s; four bends, £1; leaving an ample margin of £1, 10s; for chairs to set the pipes on, Roman cement to stuff the joints with, and the labour of two active garden labourers for four hours, who can easily make all the joints in that time under the directions of any one at all conversant with heating by hot water, and nothing is more simple; to the other

class let me say, that to heat several houses separately, and, at will, from one boiler, requires stop valves, and a great many bends, and the valves are the most expensive part of hot water erections, and where pipes have to be cut, and holes drilled in the metal, the matter comes into the province of the smith or engineer, and will cost double the expense of a simple straight-forward erection, such as I recommended, and my estimate only applies to such. Some parties tell me that even a substantial flue with arches turned to place it on, cannot be erected 75 feet long, for £15, and I am ready to grant that, for I believe, and can prove that, hot water properly erected is the cheapest means of heating such a house that can possibly be adopted.

TEMPERATURE OF VINE BORDERS.

It is admitted by all, or nearly all, gardeners who have to produce early Grapes from Vines, the roots of which are in borders outside the vinery, that it is a desideratum to warm the border by some means, so as to overcome the great discrepancy which exists betwixt the temperatures of the mediums in which the roots and branches have to act. It were easy to say that the best way is to have roots and branches under the same roof—to have the border inside. But this, even admitting its correctness, does not meet the case of hundreds of gardeners who are compelled by circumstances to cut their earliest Grapes from Vines in the Pine stove, or in company with something else which prevents the possibility of a border inside the house. At the same time it is a fact—no doubt well known to many of your readers—that when the border is made both inside and outside the vinery, and the Vines planted inside, three-fourths of the roots will find their way through the arches into the outside border. Some, on this account, question the utility of inside borders at all.

Our business at present is with Vines the roots of which are, of necessity, all in outside borders, and the best means of securing a genial temperature for such. In a few instances, comparatively speaking, the borders are chambered underneath, and heat applied from below by means of hot-water pipes. Of the success, or otherwise, which attends this method, I cannot speak from experience; but if the deductions which may be drawn from the difference of temperature (in the winter months) of the earth 2 feet from the surface from that which is found a few inches from the surface, the bottom of the border may be safely left to itself. But those who have practical experience on this point would do well to make it known *pro bono publico*.

The method practised, in nine cases out of ten, is to cover the surface of the border, shortly before forcing is commenced, with stable dung and leaves in a hot state. Whether such an application as two or more feet deep of such materials in a damp state, placed on a border

which has been exposed to the drenching rains and searching winds of autumn, does much towards the end in view, may, perhaps, be justly questioned. I know a most successful forcing gardener who had for years adopted this system, who at last gave it up as comparatively useless, and instead, covered the borders with a thick coating of charcoal dust. Others there are who use no manner of covering fit to supply heat; but simply cover the border with tarpaulin, to throw off the rains, and get first-rate Grapes early in the season. Under such circumstances, learned professors would tell us that the roots being in a medium the temperature of which is so much lower than that in which the leaves and branches are, the leaves in a high temperature would consume the sap of the stem much faster than the roots could supply it; and yet somehow fine leaves, and fine berries too, are matured year after year under such circumstances. I am not now attempting to repudiate the desirability of a greater equality in the temperatures of the air and the soil.

One thing is certain—*i.e.*, where it is desired to have warmth in the border, it is decidedly an error to leave the border exposed to the chilling rains and winds of winter, up till Christmas, and then cover it with hot material a week or so before forcing is commenced. Yet this is common. The well-known fact that in the early autumn the temperature of the soil is higher than that of the atmosphere, ought to be sufficient inducement to take some precaution to prevent the radiation of that natural warmth, whether we afterwards apply hot materials or not.

But after all, the question with me is—Whether, if this natural heat is properly taken care of, hot material is at all necessary?

Let the border be covered early in the autumn with a foot thick of some loose dry material, such as hay or straw, and then thatched with 8 or 9 inches of good wheat straw, thus preventing the escape of the heat, and warding completely off rains and winds, and I will venture to say that the temperature of the border at mid-winter, will be high enough for all practical purposes, and a deal of labour will be saved. I tested a border (which lies on a cold subsoil of clay—but well drained, and partly above the ground level) in the first week of last February, during severe frost, and in plunging a thermometer about the middle of the border, to the depth of 15 inches, it rose, in ten minutes, from 40° to 60° . Without entering into the question of how far heat applied in the usual way from above, will penetrate into a mass of wet, and not unfrequently heavy, soil, I would ask, if not the temperature I have named, as secured by a simple but effectual covering, is not sufficient to start vines with? In a letter from a correspondent in the west of England—who adopts the plan I describe, and ripens the Grapes in April, he states (in the end of February)—“our early Grapes look splendid, the foliage is like parasols in size, and the bunches large and compact.”

DHAIBHAIDH.

DEGENERACY IN FRUIT TREES.

I CANNOT help expressing the interest I feel, I daresay in common with many horticulturists, in the discussion at present carrying on between the *Scottish Gardener* and the *Gardeners' Chronicle* on the longevity of individual varieties of our fruit trees. It is a matter of very grave importance in a practical point of view, for if it can be proved, as Dr Lindley thinks, that a variety of Pear and Apple once raised can be retained henceforth and for ever, we have only to select the sorts we wish to grow, and by engrafting on a healthy stock, or by raising from layers or cuttings, rest satisfied that our favourites will live with us and furnish our tables with their peculiar produce.

I do not intend to enter on the subject of cell growth and the physiological grounds on which Dr Lindley founds his argument of the persistence of varieties of plants once gained; but to refer to matter of fact, all experience is against him, and no man in his senses about to plant, would ever think of putting into the ground varieties of Pears and Apples which, although of the finest old sorts and general favourites, have got into a state of decay, which no stock in the world is capable of bringing back to its original vigour.

In this quarter, which probably is one of the best Pear districts in Scotland, and where we have trees standing several centuries old, Pears, which 30 or 40 years ago were the *élite* of our orchards, can no longer be grown: it matters not what the stock may be, or however healthy, these old varieties cannot be coaxed to grow. In a few years they sicken and die out, and to show that this depends on the graft, and not on the stock, a recent variety engrafted on the same stock will thrive admirably, and in a few years make a large fruitful tree. The doctor may argue as he does, that it has been bad management which has weakened the tree and brought it into a state of decay; but the same argument ought to apply to the seedlings of such trees, for a seed, on the doctor's own showing, is merely a changed bud: yet this is not the case, for seedlings, even from these decaying trees, are in the main, strong, vigorous, and healthy; but alas, no longer furnish us with our fine old favourite fruits. But leaving, for a minute, fruit trees, and turning to florists' flowers, such as the Tulip, Ranunculus, and Anemone, which receive such skilful and unwearied attention; what is the fact? why, every cultivator of these plants knows that, laying aside constitutional variety, the more recent the seedling, the more vigorous the plant, the older the sort the less vigorous, until at last it ceases to increase its buds, cannot be propagated, and finally dies out; hence, the constant aim of the florist to raise seedlings, not merely for the sake of novelty and improvement, but to replace the older sorts that are dying out in spite

of his utmost attempts to preserve them. Here the plant instead of receiving its nourishment through the intervention of the stem and root of a congener by grafting, draws its nourishment direct from the soil and forms fresh buds yearly, yet the same law of limited endurance is attached to it as to the other.

It is quite futile to refer to animal life for an argument, for the analogy does not hold, at least in the higher class of plants and animals. In the lower classes such as the Zoophytes, certainly we have germination as a mode of increase, but along with that we have what every living being has, so far as yet known, the union of primary cells or impregnation as the starting point of reproduction, and we have no proof that germination, without the former mode, could continue a hydra or such like, onwards *ad infinitum*.

But to return to our fruit trees, the argument in a few words is, can art perpetuate what nature limits? Nature limits the duration of fruit trees to a certain number of years, some more some less; but every tree springing from a seed and growing in the soil, dies at last of old age. The taking a portion of this tree while growing in the shape of a bud or scion, and giving it a fresh root and stock to grow on, might seem to give it the chance of living for ever. Dr Lindley and his adherents mainly on theoretical grounds, hold this to be the fact. Experience however, that stern teacher, denies this; many of our finest fruits, particularly Pears and Apples are continually slipping through our fingers, in spite of all that our art can do to retain them; if any means can perpetuate a variety, that means the horticultural art has not yet pointed out, and until that has been pointed out, no reasoning or argument on the matter will induce any sensible man to plant an orchard of Ribston Pippins or Crawford Pears. The Doctor's appeal may be aptly concluded with a nautical proverb. "He may tell this to the marines, but the sailors won't believe him." L.

BLACK BARBAROSSA GRAPES.

BY MR A. CRAMB, TORTWORTH COURT, GLOUCESTERSHIRE.

Mr Thomson is kindly welcome to whatever information he may have received from my communication, and I desire to offer him my obligations for the courteous and temperate way by which he introduced his objections to some of my statements regarding the character of this Grape. The principal object I have in taking up the subject was to give currency to such facts as presented themselves during my experience, and in strict relation to truth. Mr Thomson must be well aware that this is purely an age of humbug, and that our united efforts are required to state precisely the value of new articles that come under our notice; and were we to do so, superla-

tive adjectives would, in hundreds of cases, give place to the positive.

It does appear inexplicable that results should differ so widely without an apparent cause; but one of some kind, however feeble, must exist, although the state of my information does not warrant me in attempting to give an explanation. With me the management of this Grape differed in no respect from the treatment the other varieties in the same house received, and they were satisfactory, both in quantity and quality. Before I had an opportunity of giving personal judgment in this matter, I frequently heard from respectable authorities that the Barbarossa Grape is a shy fruiter, but was unwilling to believe all that was said against it. Never having failed to make the most obstinate Grape Vine yield submissively, I did not entertain any apprehension of being unable to overcome difficulties in this case. "But no," says the Barbarossa, "Ye maunna meddle wi' me;" but I did interfere, had its head cut off, and substituted one of a more flexible character. No accusation can be brought against the quality of my Vine border, as it is made of the best materials, well drained, and the depth of soil does not exceed 20 inches.

The intervention of some other cause than over-cropping must be charged for producing deficiency of colour in the Barbarossa Grapes to which Mr Thomson alludes, as my experience runs quite contrary to his statement. Last year one of our strongest Vines produced only one bunch, which changed at the period of ripening to a brick colour, while those Vines carrying from five to six bunches were as dark as well coloured Hamburgs.

Who can explain the cause, for I freely confess my knowledge of vegetable physiology does not allow me to hazard an opinion.

Persons who desire late Grapes cannot possibly select any varieties so well qualified for that purpose as the Muscat of Alexandria, Saint Peter's, and Charlesworth Tokay. All the sorts of Grapes worth growing could easily be reduced to ten kinds. There are no less than five distinctions made among Hamburgs, while I have never been able to discover any difference among them. But we are soon to have a Golden Hamburg added, when we will at least have a difference in colour, if not in quality.

ROSA CANINA—THE DOG-ROSE.

THE Dog-Rose, which is found to be indigenous to Scotland, England, and France, in all of which countries it has been grown, and acknowledged as being the best adapted for using as a stock on which to bud favourite varieties of the Rose, so as to form miniature trees or standards. Yet, notwithstanding such to be the case, how unsatisfactory are the results, and how transitory the existence of many beautiful varieties when budded and grown as

standards on the Dog-Rose. This, doubtless, leads to sad disappointment, and often unnecessary reflections on the Rose growers who supply the plants; whereas, were the true cause of failure more generally understood by amateurs and others, such unsatisfactory results as alluded to above, would in a great measure be got rid of. But how, asks the reader, are we to understand? Wherein have we been at fault? In reply to which, I would say study nature, and act more in accordance with nature's laws, and rest assured that success will be more readily obtained. I have often been grieved, while executing orders in accordance with the demands of the public, to know that many of the varieties, even under the best of treatment, would not survive or flower satisfactorily after the first year. Yet, notwithstanding, such is the anxiety for certain varieties of the Rose as standards, whether they be suitable or not, that parties will order such, and as a matter of course, the Rose growers have no other alternative but to supply varieties according to the demand. The remedy for this evil must rest, therefore, in a great measure, with the public themselves, by ordering such sorts only as are sufficiently vigorous in their habit of growth, and constitutionally hardy enough to withstand the climate in which they are intended to be grown.

It has been said, however, and that very recently too, by a writer (T. M. L.) in the January number of the *Scottish Gardener*, that the cause of failure was in consequence of our Standard Roses being either imported from France, or ordered from Rose growers in the South of England, and consequently were unfitted to withstand a cold northern climate such as ours; that the Dog-Rose of England and France was something different, or else that it was reared in too favourable circumstances to be of much use in Scotland; and, mark me, the principal cause of failure the writer imputes to the Dog-Rose, or stock on which the Roses have been worked, and that, unless our Scotch nurserymen bestir themselves, and collect the Dog-Roses from our native glens, prepare them and plant them according to rule—and then, but not until then, does the writer consider that we have got the “right stock in the right place;” and that, after a season or two the Scotch nurserymen would be enabled to supply Standard Roses, well established plants, on our native stocks, as an article of commerce, which will prove in every way much more satisfactory than any thing of the kind they have as yet been accustomed to. My experience, however, leads me to think differently; something else must be considered before we can reasonably expect to see Standard Roses generally, as such, succeeding well, and of long duration. I do not believe that the cause of failure is owing to the Dog-Rose, or stock, whether it be of French, English, or Scotch growth, neither would I object to Standard Roses being imported either from France or England, if proper care be taken in packing, so that they may not be dried during the transit. Why should we object? I have every reason to believe that

Standard Roses, imported from France, may be found in Scotland, upwards of thirty years of age, still in health and vigour, and likely to continue so for years to come, if properly attended to. I merely mention this to satisfy the public that the cause of failure should not be imputed to the Dog-Rose, or stock on which the varieties have been worked; that is to say, if they have been properly prepared and well rooted before the operation of budding has been performed. This, of course, the judicious Rose grower will attend to for his own advantage, as well as for that of the public. I would, therefore, suggest as a remedy for the existing evil, that the Rose growers and the public generally would come to a better understanding as to what sorts of Roses are the best suited, and the most likely to give satisfaction when grown as Standards, for I am fully convinced that until we have the "right Rose in the right place;" and then, but not until then, will Standard Roses generally give that satisfaction which the purchaser would very reasonably expect. But how, asks the amateur and others, are we to understand what sorts are suitable? To this I would reply, consult your nurseryman, or select such sorts only as are described in the Rose growers' catalogues as being robust or vigorous in their habit of growth. This would give the public the privilege of selecting, and at the same time, the results I have every reason to believe would be generally much more satisfactory. There are many beautiful varieties of the Rose perfectly hardy, yet so diminutive in growth, that when budded on the Dog-Rose it cannot appropriate unto itself the juices of a vigorous stock; in consequence of which the stock, in an effort to save itself, sends out numerous suckers from the stem and roots; these are again removed, in order to strengthen the Rose, but the Rose not being able to receive the whole juices of the stock, the latter becomes enfeebled and eventually dies. There are also some varieties amongst the China and Tea-scented Roses, that are sufficiently vigorous so as to succeed as Standards, yet not constitutionally hardy enough to be grown as such in the climate of Scotland.

The foregoing remarks were written for the March number of the *Scottish Gardener*, but I omitted sending the same to the printing-office until too late. My ideas, however, were very ably anticipated in that number by Mr Thomas Appleby, Rosemount Nursery, York, whose article is well worth perusal by all who are interested in the culture of the Rose.

CULTIVATION OF THE HOLLYHOCK.

BY WILLIAM CHATER, SAFFRON WALDEN NURSERY.

THEY require good old garden soil, well trenched over to the depth of two feet, with plenty of thoroughly decomposed manure,

such as old Cucumber beds, or night soil, mixed with the earth. If the subsoil is wet they will thrive remarkably well in summer, but in winter wet is very injurious to them, when old plants are allowed to remain; to prevent which, I remove to the depth of one or two inches the mould round the neck of the plant, and fill up with white sand, about six inches round the stem, level with the surface; it is simply to preserve them from wet, insects, and slugs, from which, in the winter, they are apt to suffer very much, if not killed. I strongly advise young plants to be planted every year, as you would Dahlias, if you wish to secure fine flowers. They may be propagated by single eyes in July and August, also cuttings in the spring placed in a slight bottom heat. Young plants raised from summer cuttings are best preserved by re-potting them in October into large pots—the larger the better, in light, rich sandy earth, and placed in a cold frame—thus they will grow during the winter. In March or April turn them out into the open ground, and they will bloom fine and as early as if planted in the autumn. Plant them not less than four feet from row to row, and three feet apart in the row. If grouped in beds, not nearer than three feet each way. They will grow well in the shade of distant trees, but by no means must the roots interfere. In May, when the spikes are grown about a foot high, thin them out according to the strength of the plant; if well established, and very strong, leave four spikes; if weak, two or three; when they are required for exhibition, only one must be left.

The following observations on exhibiting perhaps may not be out of place here, and as I believe the best way of showing the Hollyhock is in spikes, I venture to give my opinion of what I consider as the standard of a perfect spike. In judging, the first point I should notice is the individual flowers on the spike, the perfection of which consists in the petals being of thick substance, the edges smooth and even. The florets occupying the centre must be compact, closely arranged, rising in the middle to a half globular form, with a stiff guard petal extending about half an inch, or in proportion to the size of the centre ball, so that the different parts of the flowers have an uniform appearance. Second, the arrangement of the flowers on the spikes should be regular, not crowded together into a confused mass, nor loosely hanging with open spaces between each flower, but so disposed that the shape of each may be distinctly seen and fully blown, the uppermost covering the top; and nothing can add more to its beauty than a few small green leaves between the flowers, which give it an elegant and graceful appearance. The third point is colour, the brightest, strongest, and most distinct, stand first, but it is desirable to obtain all imaginable shades. Stake them before they get too high, and secure them well in by tying, and they will grow erect. The most robust grower does not require a stake higher than four feet from the ground. If the weather is dry at this season of the year, they must be watered

with a solution of guano, or any other liquid manure, poured out carefully round the roots, avoiding pouring it on or too near the stem. To grow the flowers fine, cut off the lateral shoots, thin the flower buds if crowded together, and take out the top of the spikes, according to the height desired, paying attention to the usual height and habit of the plant. Observe, by topping it, you may increase the size of the flower, but at the same time, shorten its duration of flowering, and perhaps disfigure its appearance.

OPEN BRICK WALLS *VERSUS* PROTECTION.

It appears from the opening of this case "for the prosecution, that plaintiff has occupied a very prominent position in connection with horticulture for some centuries in the British Isles, and having, with but few exceptions, performed the duties imposed upon him in a satisfactory and economical manner, would always have continued to do so without a murmur, had the same attention been paid to him as at the outset, but defendant, a mere youth, comparatively speaking, has of late years insinuated himself into the notice of many of our horticulturists under promises which certainly sound very favourable, as they were to the effect that if they would but employ him (defendant), they would be sure of good crops, no matter how they planted their trees, only that their roots were somewhere in the ground, and no matter whether they attended to their borders, or thinning, stopping, or ripening the wood; in fact, their trees might be allowed to grow just as they pleased, but a good crop would infallibly be the result, if defendant were only employed in some one of his garbs, for be it understood he assumes various aspects. Sometimes he puts on a glass structure called an orchard-house, sometimes another called glass-walls, other dresses he calls *frigi-domo*, nets, mats, canvas, fir-branches, straw ropes, &c., &c. Now all these things tended to dampen and throw plaintiff very much into the shade, and he fears, in a very short time, into oblivion. But as he did not wish to take any undue advantage over defendant, it was decided to await patiently till the issue of some very unpropitious season should enable the latter to test his capabilities to the utmost; and as it is allowed by all that the spring of 1856 was an extraordinarily unpropitious one, plaintiff decided that the time was come for him to endeavour to vindicate his cause, hence the present action."

Such is the introduction of this case, as it appeared in *Turner's Florist* for October last, see page 294. A great many of our leading horticulturists were called as witnesses, both *pro* and *con*; various and conflicting were the statements given, some of which for the prosecution, in very unqualified terms, described protective materials as an unnecessary addition to garden expenditure. In a word, a

verdict was found for the plaintiff (no protection), and a recommendation given to discharge defendant (protective materials) from their service as soon as possible, except in extreme cases.

Now, from such a decision we would appeal. It may be all very well for the gentlemen of the balmy south to throw protection overboard, on the plea that it is an unnecessary garden expense, but we Northerners must pause before we adopt such views, even at the risk of being charged with creating such expenses, and that too, though our positions may not come under the exceptions, viz., extreme cases; and granting we pay quite as much attention as our grandfathers did, as to how we plant our trees—nay, are somewhat more particular about their bearing smaller crops of wood, and of that appearance too, which our progenitors would have described as being stunted, and not well grown. But to the point, we are fully alive to the importance of having fruit trees well planted, thinned, and the wood well matured. Without such a state, fruit need not be expected, even with protection in its best adapted form; still, we insist, that the trees may be in the best possible state for producing a crop, and that that crop may be entirely destroyed, unless a proper means of protection be adopted. How frequently are we visited when the trees are in blossom with cold rains—nay sleet and snow—during the day, and succeeded by ten, sometimes twenty, degrees of frost at night. The blossoms and wood may have been well matured, but we think there are few who will rest satisfied that protection should be discarded under such circumstances. There is always a certain degree of moisture in the expanded blossoms of trees; and when drenched with external rains and snows, surely they are much more likely to be destroyed by frost than if they had been dry. Now, if this be patent, surely we must protect in some shape or other; and here we would remark, that the produce of a few years would more than repay the cost of the material sufficient for such a purpose—sufficient to keep the trees dry, and sufficient to ward off frost, or, in the phrase of the day, to prevent radiation. The reason why protection has got such a bad reputation is, that it has got into bad hands. How frequently do we see trees, when coming into bloom, completely shaded with Fir branches, with the view of keeping off frost. Well intended; but these same branches also keep off sun and air—two most essential agents for securing a crop of fruit; and a considerable process of elongation has to be gone through until the blossoms on tip-toe get a breath of fresh air or a ray of sunshine to ripen or diffuse the pollen—without which perfect fruit need not be looked for. Again, there are nets of various substances which are pressed into the protective service, in the hour of need and danger; and very useful they are, if properly employed. But here, again, they are ill commanded; they are put up when the trees are coming into bloom, and there they remain until the trees are growing through them. The same objections are chargeable here as in the case of Fir branches; only the nets have the advantage of admitting the light

in a more regular manner. But, let the material be what it may, it should not be used as a fixture, or it will be there when you don't want it. Now, by the time your pages are before your readers, many of them will be feeling anxious to secure some favourable-looking tree from the attacks of severe frost; and various will be the methods adopted, every one feeling that he has done his best, under the circumstances. Now, a question naturally arises (in the minds of those who read the *Florist*), why all this trouble, and anxiety, and expense? This tree was kept very thin of wood last year; it had no heavy crop—the buds look plump and well. And when all these objects are gained, the leading horticulturists of the day tell me to have faith; throw your nets out of doors—your naked wall has done its duty before, and it will do it again. By-the-bye, a coping board is admissible—you may put up that; but as for the rest of protection's inventions, have nothing to do with them. Well, this is perplexing enough; I don't know what to make of it. I had a small piece of net or canvas I could have put over my tree; but as for coping boards, I have no brackets to rest them on, and I could have put on my bit of net much cheaper, and at once. As for trusting the open wall, it is all very well; but it cheated me out of a crop one year, by my being too long in covering, and I have never trusted it since, and have always had a sprinkling of fruit every year.

In conclusion, we would say by all the means in your power, use protection for your trees when in blossom, or approaching that state, but have it of a movable description, that you can take it away unless when danger from frost is apprehended, and have it so that it can be put up or down in a few minutes, and scrim, hessian, or thin canvas is the best for the purpose. A simple and efficient plan is to have a canvas made up the whole length of the wall, intended to be lowered in one piece, and fixed at top to a strong wire stretched along the centre of the coping; this wire is also useful for fastening nets up for birds, thereby preventing the injury done to the joints of the coping when nails are driven in to suspend the nets from; then at distances of 15 feet place rods 2 inches square from the ground, 2 feet from wall at bottom, and close under the coping at top, drive them slightly into the ground to keep them steady, then stretch a piece of rope yarn along the wall, and upon the poles, say 4 feet apart; this will prevent the canvas in windy weather from being blown against the trees, the edge of the canvas can also be fastened to the upright poles; in rolling up, let one person be on the top of the wall, and another at the bottom, then let them begin at one corner and roll up the canvas upon itself, and lay it upon the top of the wall; five minutes will uncover 200 feet of wall, and half that time put it on again. We are putting on canvas for the fifth year as good as new, and which cost 3^d per square yard at first. We have never missed a crop of fruit these 8 years from said wall—it is covered with Peach, Apricot, Pear, and Plum trees, while from walls uncovered, crops have been very poor indeed. We are upwards of

400 feet above the level of the sea, with a cold retentive subsoil, still we don't consider this an extreme case, and yet feel the benefit of protection when properly applied. We therefore think, both from our own experience and observation, that we cannot discharge the defendant (protection) from our gardens in this our northern latitude, though decidedly opposed to all fixed coverings.

A. A.

THE CAMELLIA.

BY MR J. ANDERSON, GARDENER, MEADOW BANK, UDDINGSTONE.

As the Rose stands pre-eminent as the queen of out-door flowers, so may the Camellia be justly termed the queen of the greenhouse. We have not the fragrance of the Rose embodied in the Camellia, but we have a counterpart in beautiful dark green foliage at a time when the Rose is robbed of her garlands; independent of all contrast, we have the Camellia in bloom at a season when all nature seems at rest; and were it possible that an individual with fine floral taste, had been shut out from the Camellia world, for a limited period of his or her life-time, and for the first time be ushered into a house where a few select novelties were in bloom, I know nothing that would excite the admiration more—that would call forth greater plaudits, than the beautiful texture, the admirable form, the great substance, and, I may add, the large size of a few of the leading Camellias; and as I propose in a subsequent occasion to single out some of the best varieties, with a short description of character attached thereto, I will meanwhile briefly treat of the best modes of their management as plants. And in order to do so, I would confine my observations in three directions. First. Their treatment during the growing season. Second. Their treatment during a season of rest. And, Third. Their treatment when in bloom.

First, then, although the Camellia as a plant is hardier than most of those we transfer to our greenhouses, in fact many consider them as hardy as a Portugal Laurel, it is by no means an ornamental plant with even greenhouse treatment; although some kinds are known to grow and flower in a comparatively cool house, we are not warranted in concluding that such is the best mode of treating them. You may have the dark green foliage, you may have the plant, if otherwise well managed, a picture of health, but in general cases you have but few flower buds, and if such treatment were continued for a series of years, you would in many cases have none at all. The question naturally occurs—What treatment do you consider best to render them ornamental? I have no intention in the meantime to deal with their propagation by cutting, or the working of them on stocks, as I will have sufficient to pay off my score without that: but I will say something of the soil they seem to do

best among. We often see, when imported from the Continent, that they have been chiefly grown in sandy peat; but I would recommend one-third well chopped turfy loam, one-third leaf-mould, and the other third peat and sand in about equal proportions; silver sand is the best. This will be found a good ingredient for growing them in; they may be successfully grown without peat at all, having the leaf-mould as a substitute, but I think those grown after this manner have not that dark green foliage so much to be admired in a *Camellia* plant. Those, then, that require re-potting ought to be done before the leaf-bud bursts,—in short, immediately after done flowering, then placed in the *Camellia* house, or, where no such accommodation is afforded, in the Vinery, and it will be found they succeed all the better if started with the Vines; they delight in shade and moisture; shade from the scorching rays of the sun, and all the light you can afford them when the sun's powerful influence is on the wane; those which do not require re-potting should occasionally be served with a little diluted manure or guano water, but none ought to be given those which are newly re-potted, as if repeated, it would render the soil too strong for the rootlets to luxuriate in, while, in the other case, more especially in the case of large plants which are neither convenient nor practicable to re-pot or re-tub, the roots having imbibed the greater portion of nutrition from the soil, the manure water circulates fresh ammonia, and materially invigorates the growth and appearance of the plant, they may consequently remain many years in the same pot or tub and never in the smallest degree detract from their ornamental appearance. There can be no fixed time for starting the *Camellia* into growth, as those with large collections can have a sprinkling of them in bloom for eight or nine months of the year; but I should say the best general time for bringing them away is about the middle of February or beginning of March; however, the sooner they are started into growth the better, for I find our early flowering ones never drop a bud, because their buds are properly set, and they can with all freedom be put out of doors early in June. If the *Camellia* during a season of rest can stand a greater amount of cold than any of our greenhouse plants, so in the growing season can it stand almost any amount of heat if properly shaded and well syringed overhead; but I consider a temperature of 45° during night, and from 50° to 55° during the day, a good medium when first put into heat, gradually rising to the maximum of from 70° to 75° during night, and from 80° to 85° during the day, giving plenty of air on all favourable occasions, but always shutting up early in the afternoon, with a good moist atmosphere for nocturnal evaporation. I may here add, in passing, that mottled varieties never come true to character, unless grown in strong heat, and not over freely shifted. The buds, when they are pushing away into shootlets, should be very carefully shaded from a vertical sun, or it will tell on their foliage for many years; but it is perfectly necessary

that they should have all the light you can possibly give them, which you can in no case do unless provided with a Camellia house, although they do admirably in a vinery. The only drawback is when the Vines cover the whole house, this shades them both night and day. The young shoots that have come away rapidly will by-and-bye be hardening themselves into tolerable firm wood, and young flower-buds will be observed to be forming on these shoots; when they swell to about the size of a good sizeable pea, they may with all safety be put out of doors (the earliest of them not being in a state for such a transition before the first or second week of June) in a shaded, sheltered, dry situation; cold night temperature should be especially guarded against; better keep them a week or two longer in the house than incur the risk of getting such a check that will do the general structure of the plant more harm than anything I know of.

Second. If one period more than another is marked out for the Camellia's season of rest, I think from the time you set your Camellias out of doors until the time when the bud begins to swell into bloom, may very appropriately so be called, although, strictly speaking, it ought to have no season of rest; my reasons for so saying will shortly appear. The first thing to set about after placing them in their summer quarters, and in order to ensure good bloom, and not weaken your plant's energies too much, is to thin all the plants of flower buds to the number you may anticipate you require, and in the case of established plants, one flower bud to every shoot-let may be allowed to remain, but even that is too much in the case of small plants; it would be advisable to thin them a great deal more, if you wish to have good blooms every year, and keep your plants in good condition. I must confess I consider this season the most critical for their careful management, and for future success, as is well known, a great many complaints go abroad about buds dropping off; and why? It may be the plant is in bad health, and the circulation of the juices not rapid enough to sustain a very limited number of flower buds; it may be the plant has been too long retarded and placed in a temperature too low, when it ought to have been growing vigorously, and consequently too little time for its season of rest; it may be from getting too dry at the root, and the soil rendered impervious by such neglect; it may be from a quantity of worms finding their way among the roots, and constantly disturbing their powers of radical working; and last, though not least, it may be from their being subjected to a too rigid observance of their season of rest, keeping the juices stagnant by a temperature too low. I say, then, if you wish the buds to remain on the plants, keep them always a very little excited, which accounts for my observing that, strictly speaking, they ought to have no season of rest; however, there are some varieties that are more apt to drop their buds than others, but if all those evils are particularly guarded against, it will

in a great measure render you completely successful, when the fruit of your labours display themselves in all their floral beauty.

Third. The *Camellia* ought never to be forced into bloom, because the flowers are much smaller—never so brilliant and true to their respective colours. Where early bloom is required, those sorts ought to be selected which generally bloom first, put a little earlier into heat after blooming, get properly matured, and they will be found coming into bloom when the frost forewarns you to prepare for their winter quarters; those that naturally bloom later should invariably be reserved for that purpose; your *Camellia* or other house where you reserve them before taking into the show-house when in bloom, should never be below 38° , although I have already mentioned that they are comparatively hardy in themselves, yet if the thermometer be allowed to fall much lower, they are apt to drop their buds, and nothing can be more mortifying than to be thwarted on the brink of flowering, when your efforts have hitherto been attended with success. They will require but a moderate supply of water during early winter; but as it advances into spring they will require a little more. Like all other plants, they should get as much as penetrate through the entire ball, giving none until the soil appears moderately dry again. I find when they are in full bloom the temperature should never be below 36° ; because the flowers, if suffering a greater degree of cold, will present yellow marks and spots, more especially the white varieties. A little fire heat should be given to dry up any dampness in the house, with plenty of top air, both day and night, when the weather is favourable.

(To be continued.)

PRIMULA SINENSIS.

For decorating either greenhouse or conservatory during the winter and spring months, the *Primula Sinensis* is unrivalled for variety and brilliancy of colour, as well as for producing a succession of flowers for a longer period than almost any other plant. They may be had in bloom at all seasons, but their services are most wanted in general from October to May; and where quantities of cut flowers are required, this class of plants will be found one of the most useful auxiliaries for affording a supply, as well as in tinging the show-house with something like the appearance of summer. The *Primula* ought to be cultivated by all who have a glass house at command, yet it is not, from some cause or other, grown to the extent that its merits deserve, neither does it generally appear to receive much attention in the way of cultural management; this may in part be owing to its being old fashioned, or more probably to its not being recognised by Horticultural Societies as a fit subject for the prize list. Nevertheless, I think that well grown plants of the *Primula*, with several flower spikes, some of them 18

inches high, and the younger members aspiring to the same altitude, form a pretty object, and I have no doubt but they would be more admired on the show table than either *Crysanthemums* or *Hya-cinths*.

In making the following remarks on my method of growing them, it is more my object to bring them under notice than to describe any new method of growing them. Sow the seed any time between the middle of March and beginning of April, and place the seed pots in a seed bed, with a gentle heat, but if such is not at command at the time, a Melon or Cucumber frame, in which the first rank heat has subsided, will answer well. Place them at the back in preference to the front of the frame, so that the young seedlings when they appear, will have more of the benefit of the air when the sashes are tilted up, and thereby escape their being drawn, especially if the heat be stronger than is required. As soon as they are large enough to bear planting into separate pots, prepare soil by breaking well and sifting some good loam and leaf-mould, and fine sand in about equal proportions. Three-inch pots will be sufficient for the first potting; then place them in a frame near the glass; water through a fine rose, and shade the plants from strong sunshine for a few days until they show signs of having again started into growth, then air ought to be liberally supplied. Keep the plants rather dry than otherwise, and syringe them occasionally in hot weather. As soon as they require another shift, transfer them into pots a size larger, and by the end of July or beginning of August, they ought to receive their final shift into 6 or 7-inch pots, into soil of similar composition as previously used. Liberal drainage is indispensable, and a covering of moss should be laid over the potsherds to keep the drainage open, so that all superfluous water may pass readily off. A frame is the most suitable place to grow them in, until they are housed for the winter, which should not be later than the middle of September. Growing them in a frame has this advantage, they can be kept nearer the glass at any desired angle than they can possibly be in ordinary cases in larger structures. Air should be liberally given by day and night in very warm weather, and they should be shaded from the mid-day sun in preference to a too frequent use of the watering-pan. As a rule, the *Primula* should be allowed to approach flagging before being watered, as they are rather liable to damp off if too freely supplied with water, more especially during the winter months. A too damp atmosphere and too much water applied to the roots are their greatest enemies, and those who would have them grown to any perfection, must guard particularly against these. They stand a considerable degree of drought before being killed, which teaches us the safest side to err on. As often as the plant shows flower during summer, pinch out the embryo flower buds until the time is approaching when they are wanted to flower, which in general will be about the end of October, when summer flowers are getting scarce. After the plants

are done flowering in the spring, the best of the common and frimbriated varieties ought to be selected, and placed in a sheltered situation out of doors with an eastern or western aspect, and if they are protected from heavy rain during hot weather, it will be much in their favour, as this is their period of comparative rest until they are potted and again started into growth for another season, which should be done at the time recommended for transferring the seedlings to their flowering pots. They ought to receive 8 or 9-inch pots the second year according to the strength of the plants. In potting shake away gently the old drainage, so as to damage the ball as little as possible, and if the plants have been properly attended to, the ball will be covered with fine white roots ready to push into the fresh soil in their new pots. Particular care ought to be taken that the ball at the time of shifting be in a proper state as regards humidity, *i. e.* neither too wet nor too dry, as in either case the plants are liable to suffer; they ought to require no more water when shifted than a slight sprinkling overhead. All decayed leaves should be carefully cut away, and their decumbent stems should be kept rather above the surface of the soil. Plants of this age make fine specimens. I have had them with many flower stems 18 inches in height, and more in circumference, closely set with leaves; and I have no doubt but, by being careful in selecting fine strong growing varieties, that that size might be exceeded with good management.

CUMBRIA.

A NEW FERTILISER.

I AM induced to send you an account of a newly invented fertiliser which has made its appearance in this neighbourhood, called "Standen's Organic Ammonia Phosphate." It renders the use of manure water quite unnecessary, thus doing away with that unpleasant and disagreeable liquid, the use of which, in houses where ladies are in the habit of visiting, is very objectionable on account of the bad smells that often accompany it, to say nothing about the administration of it, which is anything but an enviable job. I have tried the mixture referred to above upon various stove and greenhouse plants, by sprinkling a little on the surface of the soil—say a teaspoonful on a six or seven-inch pot. When water is given, the composition partly dissolves and gives the water a milky appearance, which is absorbed by the soil, and the effect upon the plants is very decided, giving the foliage the most beautiful and healthy appearance possible, and throwing a strength and vigour into the plant not to be surpassed by anything that I know. It is not until water has been applied several times that the whole of the mixture is dissolved, and therefore it is given to the soil and plants by degrees, and its effects may be seen through the whole season. I have applied it to Pelargoniums by giving one dressing at the beginning of March, which

gave me the most healthy lot of plants that I ever had. A thin dressing to Indian Azaleas, just when they are beginning to grow, made a decided improvement in them. I injured some of my Gloxineas by giving too much, while those that had but a slight sprinkle were greatly improved by it. Now I use it to all the inmates of my stoves and greenhouses with the very best results. It is sold in tin boxes, which hold about a gill, for which sixpence is charged.

T. J.

Manchester, March 23, 1857.

OBSERVATIONS ON HEATING.

To all interested in horticulture a very important question is—wherein consists the superiority of hot water over smoke flues as a medium of heating horticultural edifices. I mean heating in its strict sense, apart from the great saving of fuel and labour, which all who have any knowledge of the two systems must admit is in favour of hot water. The difference on entering into a house heated by hot water from one heated by a flue is very great, so much so, that when it is necessary to have a high temperature, parties acquainted with the two systems could tell on entering into a house in the dark which of the two systems was adopted. This difference is caused by the flue absorbing the moisture contained in the atmosphere of the house. This is evident on applying water to the flue; from the vapour arising, the air again becomes in a proper state as regards humidity, and instead of the dry scorching heat so *injurious* to vegetation by causing excessive evaporation, we have that sweet, moist, and genial heat, a condition so essential for the maintenance of health and proper functions of the plant, exhalation not being carried on faster than fluids can be supplied by the roots. Hot water pipes absorb little moisture compared with flues, consequently a house heated by the former system is not subjected to the drying tendency at which the latter is. Hence the superiority of the former system for hard forcing. We have also greater equalisation of temperature with hot water pipes, the radiation of heat being nearly the same from all parts of the pipe's surface. Hence, both ends of the house are at the same temperature, which is not the case when the house is heated with flues—the end where the fire enters being scorchingly hot, while the other end is comparatively cold if the house be large. Some gardeners undervalue hot water as a medium of heating, on the ground that as good Grapes, &c. have been produced in houses heated by flues, as have been produced by those heated by hot water. This may be true; as by attention to syringing and damping the floor and flues, the atmosphere may be kept in such a condition as regards moisture, as the well-being of the plants demands, particularly if the house be large, where there is a large amount of air, which is not so easily affected by the drying tendency of the flue. But al-

though this may be, and by many is *done*, yet it is labouring under a disadvantage, because we have in the hot water pipes a medium of heating which affects the atmosphere very little as regards absorbing moisture, so that a far less amount of labour and attention is required to keep the house in a proper state of humidity. Hot water then, as a medium of heating is, as has been shown, in every way to be preferred to the old smoke-flues, while the great number of houses which can be heated with one boiler, is another important point in favour of hot water.

J. M.

THE DAHLIA.

Who was it said—a year or two ago—that the subject of the Dahlia was “worn threadbare?” It matters not; for it is not our notion, nor will we assent to it while every season shows how little we seem to estimate the capabilities of this flower, the endless variety yet to be attained, and the practicability of further improving every quality which goes to constitute our most perfect specimens, even when grown under the most favourable circumstances. We hesitate not to assert, roundly, that the Dahlia is scarcely yet out of leading-strings, and, moreover, that not a score of cultivators can grasp its more important elements with the hand of a master; and while it remains so crippled from the want of more extended knowledge, we have no right to say we have exhausted the subject either theoretically or practically. Look through a lot of “yearlings” in the seed quarters of any raiser, and you may observe specimens of every form, from the primitive to the most modern—colours of almost every shade—and, scattered throughout the whole, all the most desirable properties, whether of petal, centre, or outline; yet, “few and far between” will be the individual plants combining these properties in a manner sufficiently marked to render them worthy of after cultivation. And thus it will always be. The attainment of what we desire serves only to create a longing for further improvement; so that with the Dahlia, as with every other flower in existence, there *must* always remain something yet to be accomplished. It is only another instance of that “progress” to which we alluded at the commencement of these remarks.

If it be objected that our ideas are too circumscribed when we assert that only about a score of individuals fairly grapple with the Dahlia, we are quite prepared to “join issue” on the point. Consider the raisers of seedlings. *How many* can we enumerate who have attained to anything like eminence in the pursuit? The simple truth is—boast as we may of knowledge, progress, and enthusiasm—that our raisers, like our collections, are extremely limited in number. Trace out a score of the best varieties, and ask how many names will be found claiming to have originated them? We will answer the question. Not half a score. And who are they? The Rev. C. Fellowes, Mr G. Holmes, Mr Sainsbury, Mr Rawlings, Mr Keynes, Mr Turner, Mr Brittle, and Mr Dodds. The destinies of the Dahlia, then, would seem to be confided to the keeping of a few; hundreds of others, however, may be engaged in the good work, though with poor results; and a chance seedling of merit is almost unknown. We look, nearly as a matter of course, to the few individuals we have named for the annual production of our supply. But limited to a few as the introduction of new subjects undoubtedly is, the general cultivation of the Dahlia is equally restricted. To grow Dahlias is but a simple act, but how many fail to grow them well enough to take a prominent place in their exhibition! We are sorry to remark the lack of knowledge exhibited by a very large proportion of the dealers in this flower. Shall we be deemed too severe in stating our opinion that not half a dozen

in the trade know how to grow and show a stand of twenty-four blooms? Take our word, good reader, that the ignorance of the Dahlia dealer is most deplorable, and the more freely the opportunity of running through the country has been afforded us, the more painfully has this fact become impressed on our mind. While dealers are thus circumscribed, amateurs may be somewhat more diffused, and in lieu of six we may read nine, or at most a dozen. It has been our good fortune to attend a multitude of Dahlia meetings during the past year; but wherever we have gone the great preponderance of indifferent blooms has been quite lamentable. In many instances, with plenty of competition and plenty of blooms staged, a passably good specimen could not be discerned, although endless prizes were awarded, because relative and not absolute merit was the rule by which they were adjudicated. With all this before our eyes, can we conscientiously admit that the Dahlia has reached, or, speaking generally, is even on the fair road to perfection? "But how," exclaims some one among our thousands of readers, "how is it possible to remedy this state of affairs?" Nothing more easy. To the executive of provincial societies we say—offer an invitation accompanied with a reasonable inducement that shall bring into every floral district some one or more of the acknowledged leading cultivators and exhibitors, who, by force of example (always better than precept), may illustrate what Dahlias can be made to look like, and how to place them before the public on the exhibition tables. One such collection and display would do more to set people into the right train of thinking than quires of printed treatises on the same subject. A word of advice to growers of local reputation—heroes of their own district. Do not rest satisfied with provincial honours, nor sit "at home at ease," satisfied with your many triumphs, but come forward boldly, and try your strength with the veterans at one of the great national exhibitions, where you are sure to meet with formidable competitors. Your first appearance, in all probability, will be signalised by a thorough but honourable defeat. Now take our word for it, that one such reverse will do more to make you Dahlia growers than all your previous successes. The establishment of prizes "open to all England" throughout the length and breadth of the land will create an increased number of migratory exhibitors of the higher class; and this object once achieved, we shall no longer have to complain of the dearth of good Dahlias, now so remarkable in many of the country districts.

Regarding the flower itself—is the supply of good new varieties equal to the demand? Assuredly not. We feel satisfied that a score of good flowers introduced annually, would find as ready a market as only a fourth of the number: but they must be really *good*; otherwise we shall not only be perpetuating inferior sorts, but sowing the seed of inferiority, which is still worse. "A corrupt tree cannot bear good fruit." We possess, it is true, good forms, but do we not want more of them? We have bright colours, but do not other flowers boast of the same colours still more vivid? Have we yet been able to solve the problem of a good pure white Dahlia? From the day of Bragg's ANTAGONIST up to the present moment what has been done to fill up the void? How we snap at a light flower because we have so few of that class! Cream is bleached into an unhealthy white, and tipped white ground flowers are robbed of their characteristic beauties to gain a white specimen; wide, open, long, and taper petals are tolerated if they belong to a white variety; in a word, a white flower twenty years in the rear of merit, is tolerated as *pis aller*. Again, with yellows. Try back to the days of Cox's DEFIANCE, and call to mind the multitude of aspirants, and then reflect how few have been able to "hold their own!" In this colour we have, perhaps, some choice; while the dearth of whites is complete and absolute. Where, let us inquire, are we to look for a clear and distinct white Dahlia of even moderate pretensions?

Far be it from us to ignore the efforts that are constantly making for the improvement of this noble autumnal flower. We are by no means slow to

recognise them; and if our previous remarks have been made in somewhat forcible language, be it remembered the chief object in view was the refutation of the opinion we quoted, that the subject of the Dahlia was "worn threadbare."—*Edwards' National Garden Almanack.*

THE RANUNCULUS.

The decline in the cultivation of that once popular flower, the *Ranunculus*, becomes, year by year, more apparent. For some time past it has been gradually on the wane, either from the difficulty of maintaining a continuous and healthy stock of named sorts, or from the uncertainty attending the raising of seedlings, the only possible means by which vigour of growth can be secured; perhaps both these causes combine to the depreciation, but we suspect the latter to be the more important, for admitting that many, very many of the known varieties have been with us a considerable time, yet, as a rule, by the constant addition of seedlings alone could a collection be kept in a vigorous state of flowering. The want of this continuance and steady supply we take to be the main reason why this flower has lost *caste*, we fear almost beyond the hope of ever recovering its former popularity; yet few flowers look better in a cut state. Their well-nigh perfect forms combine, with their chaste, bright, and varied colours, to render them pleasing and attractive wherever they may be produced; would these occasions were not so "few and far between!" Mr Costar of Benson, Oxon., continues to grow them to some extent, and whenever he essays their exhibition, many valuable properties are disclosed, which he has developed in the course of a long and pains-taking life. Mr Tyso, as a dealer, annually offers us a collection of fifty blooms at "The Park" show. These are acknowledged, by the majority of the visitors, as highly interesting; and interesting they truly are, in so marked a degree as to make us grieve at the loss their limited growth—as compared with years gone by—entails on us. At the Newbury exhibition some keen competition usually takes place; and although some of the productions are highly meritorious, yet we fear the same downward tendency is traceable. What our Scottish brethren may be doing is unknown to us, as we have not visited the Northern districts at the blooming season; but we *do* know that a collection sent to a grower in Herefordshire, by Mr Lightbody, gave the most unbounded satisfaction. Probably the introduction of annual drafts from the Northern raised flowers might beget an impetus for their revival and extended growth in the South. Let it not be supposed that we are using a mere figure of speech in stating that the *Ranunculus* is going out of cultivation; the entire absence of announcements from the trade proves that it is an actual fact; no catalogue, that we know of, has been issued for some seasons past. Surely this is not the way to revive the taste for this flower! If those who possess stock were to come forward and advertise it at moderate prices, some hopes of a revival might be entertained; at present, all is "weary, stale, flat, and unprofitable," in connection with what florists call their most perfect flower.—*Ibid.*

JERUSALEM ARTICHOKE TOPS.—The stalks and leaves of the Jerusalem Artichoke look rough, but if cut off when the plant is a foot or so high, and boiled in salt and water, with the lid off, they make a capital dish, which has exactly the flavour of the root. I have also been thinking (for I have not tried the plan), that if the roots were planted thickly in boxes slightly covered over with mould, and then put into heat, either to be blanched like Seakale, or allowed to be green if approved of, it would be the means of rendering this root more valuable than it is at present.—JAMES CUTHILL, Camberwell, London, in *Gardeners' Chronicle*.

FORCING PEACHES.—It would interest me, and I believe others of your readers, if you would let us have an article on forcing Peaches in pots and boxes or tubs. I have a small house which I wish to appropriate to Peaches, but I am unwilling to put up a trellis and to plant permanent trees, since a house is thus rendered almost useless for a great part of the year. In a garden of moderate size, it seems to me a much more satisfactory plan to have your Peaches in pots or tubs, and after they have fruited, to follow them with Melons or Cucumbers, or anything else you may fancy. Now, I should much like to hear from you how such a plan can be carried out to the best effect. I have tried Peaches in pots this season—not so successfully as I anticipated. My trees were obtained last autumn from a very respectable nurseryman; they were put into the house the second week in January, and blossomed well, but the result is only few fruit. The greenfly showed itself about the time of blossoming, but it was immediately checked by gentle fumigation. Somehow or other, however, I have missed it, and I want you to tell me how to do better another year. I also wish you to tell me whether more Peaches could not be grown in a house on a few large trees in tubs than on many small trees in pots. I further wish to ask which is the best way of treating Peach trees after the fruit is gathered, bearing in mind that I want to get them out of the house as soon as possible.—A LEARNER

FLORICULTURAL SHOW IN THE MUSIC HALL, EDINBURGH.

The grand floricultural display, under the patronage of the Royal Caledonian Horticultural Society, took place in the Music Hall on Tuesday the 10th ult. It far surpassed any spring exhibition ever before held in the north. The presence of numerous specimens grown in the neighbourhood of London was a novel feature in the exhibition. Mr Cutbush, of Highgate Nurseries, brought forward some very fine Hyacinths in pots. Bouquets were added by Mr Buck, of Covent Garden, whose taste in this department is well known. The following is the prize list—

Eighteen Hyacinths (by nurserymen), grown and shown in pots—1st, L.2—Messrs James Dickson & Sons, Inverleith Nurseries, with Emecus s.b., Voltaire s.w., Nimrod s.b., Triomphe Blandina s.w., Orondates s.b., Miss Ainsworth s.r.o., Grand Lilas s.b., Grandeur a Merveille s.w., Charles Dickens s.b., Alba Superbissima s.w. Laurens Koster d.b., Grand Vedette s.w., Porcelain Sceptre s.b., Norma s.r.o., Prince Albert s.b., Lord Wellington s.r., Prince of Waterloo d.w., Lord Wellington d.r.o.; 2d, L.1—Messrs William Cutbush and Son, Highgate Nurseries, London, with Mary Stuart s.w., Baron Von Tuyl s.b., Circe s.r., Grandeur a Merveille s.w., Nimrod s.b., Solfaterre s.r., La Tour d'Auvergne d.w., Bloksberg d.b., La Joyeuse s.r., Porcelain Sceptre s.b., Mrs Beecher Stowe s.r., Norma s.r.o., Duke of Wellington d.r.o., Queen Victoria s.r.o., Waterloo d.r., Grand Lilas s.b., Cavaignac s.r., Robert Steiger s.r.; 3d, 10s—Mr Charles Alexander, Larkfield Nursery; 4th —Mr T. H. Douglas, Rosebank Nursery.

Twelve Hyacinths, by practical gardeners or amateurs—1st, L.2—Mr James Henderson, gardener to C. K. Sivewright, Esq., Cargilfield, with Lord Wellington d.r.o., Prince Albert s.b., Lord Grey s.r.o., Laurens Koster d.b., Nimrod, s.b., Richardson s.w., Lord Wellington s.r., Monsieur de Fæsch s.c., Madame Hodson s.r., Norma s.r.o., Grandeur a Merveille s.w., La Tour d'Auvergne d.w.; 2d, L.1, Mr James Douglas, gardener to J. Russell, Esq., South Bank, with Laurens Koster d.b., Grand Vainqueur s.w., Mont Blanc s.w., Lord Wellington d.r.o., Voltaire s.w., Baron Von Tuyl, s.b., Prince Albert s.b., Monsieur du Fæsch s.c., Charles Dickens s.b., La Dame du Lac s.r.o., Orondates s.b., Grand Vedette s.w.; 3d, Mr Allan Cameron, Gardener to S. Hay, Esq., Trinity Cottage.

Six Hyacinths, in pots, produced by practical gardeners, or amateurs who do not grow above thirty-six roots—1st, Mr Thomas Blair, Mavisbank; 2d, Mr James Mitchell, gardener to Lady Keith, Ravelston; 3d, Mr William Young, South Bridge.

Four Hyacinths, in pots, by amateurs who cultivate their own plants—1st, W. Stenhouse, Esq., Gilmour Place; 2d, William Young, South Bridge.

Prize by Messrs Lawson & Son—L.1, 1s—Six Hyacinths, in pots, open to all—Mr James Henderson, gardener to C. K. Sivewright, Esq., Cargilfield, with

Norma s.ro., Grand Lilas s.b., Prince Albert s.b., Nimrod s.b., Miss Ainsworth s.ro., Orondates, s.b.

A separate prize, 10s, was offered for the best six Hyacinths, grown and exhibited in glasses by nurserymen's shopmen. The first was assigned to Mr D. O. Gardiner, Messrs Dickson & Sons, Hanover Street, who showed Rouge Ecclatante, s.r., Grand Vedette, s.w., Prince of Waterloo, d.w., Prince Albert, s.b., Lord Wellington d.ro., La Tour d'Auvergne d.w.; 2d, Mr Alex. Brown, shopman to Messrs Downie & Laird; 3d, Mr C. Raeburn, shopman to Mr Charles Alexander.

Four Hyacinths, grown and exhibited in glasses—1st, Mr William Young, South Bridge.

Best plant of Camellia, L.1, 10s—1st, Mr John Lyall, gardener, Pinkie House, Musselburgh, with a fine plant of Imbricata; 2d, L.1, Mr Pender, gardener, Moredun, Liberton, also with Imbricata.

Best six Camellia blooms—1st, Messrs Jas. Dickson & Sons, with Candidissima, Fimbriata, Alba Plena, Fæstii, Decus Italicum, Rubescens; 2d, Mr Foulis, gardener to J. Tytler, Esq., Woodhouselee, with Alba, Fæstii rosea, Fæstii alba, Præstii, Imbricata, Saccioi nova; 3d, Mr Thomas Blair, Mavisbank.

Best three Cinerarias—1st, L.1, Mr Macfarlane, gardener, Barnton, with very fine plants of the following varieties:—Lablache (E. G. Henderson), Optimum (Hopwood), Scottish Chieftain (Sivewright); 2d, Mr Thomas Reid, Broomfield, with Optimum (Hopwood), Fascination (E. G. Henderson), Scottish Chieftain (Sivewright); 3d, Mr Archibald Walker, Rosehall, Newington.

Hand Bouquets—1st, L.1, Mr C. W. Buck, Covent Garden; 2d, Mrs Carstairs, Warriston; 3d, Messrs Dickson & Sons.

The following prizes were awarded for vegetables, the competition in which was under the management of the market gardeners of the neighbourhood of Edinburgh.

For the best twelve stalks of Rhubarb, for which there were five competitors, the prize was gained by Mr William Reid, Rosebank, with Victoria. A second premium was voted to Mr John H. Porterfield, Upper Hermitage, for the same variety. A lot produced by Mr John Wilson, Easter Road, was recommended by the judges as of superior growth, but deficient in weight.

Six heads of Seakale, for which there were five competitors, the prize was awarded to Mrs Brydone, Murrayfield, and a second premium to Mr Wilson, Easter Road.

Three heads of Broccoli, for which there were three competitors. The first prize was awarded to Mr Alex. Lauder, Gosben, for Gillespie's Broccoli; and the second to Mr Robert Scarlett, Millholm Cottage.

For the best pint of Mushrooms. The prize was gained by Mr Porterfield, Upper Hermitage, the only competitor.

In Vanack Cabbages there were three competitors, and two prizes were awarded. 1st, to Mr Scarlett, Millholm Cottage; 2d, to Mr Alex. Lauder, Gosben.

There was a large competition in Leeks, no fewer than eight competitors appearing, and the first prize was awarded to Mrs Bryden, Murrayfield, Musselburgh; 2d, Mr J. H. Porterfield, Upper Hermitage.

The articles sent in for exhibition only, and for which no premiums were offered, formed a very large portion of the general show; indeed, it may be said that they exceeded in value those for which there was competition. The plants from the Experimental Garden were valuable and rare. Mr Thompson's, from Dalkeith Palace, cannot be too highly commended; they consisted of fine specimens of the following:—*Aspidistra elatior variegata*, *Dracena ferrea*, *Maranta sanguinea*, *Seaforthia elegans*, *Phlebodium aureum*, *Saccharum Officinatum*, *Pteris tremula*, *Livistonia Chinensis*, *Calathea Zebrina*, *Yucca Draconis*, *Corypha Australis*; in several instances two specimens of each variety. From the garden of S. Hay, Esq., Trinity Cottage, Rhododendrons, Azaleas, Hyacinths, &c., in excellent condition. From David Anderson, Esq., of Moredun, a valuable collection of Azaleas, &c., reflecting the highest credit upon Mr Pender, who has charge of the plants. Mr Macfarlane, Barnton, in addition to the splendid specimen of Cinerarias, to which the first prize was awarded, sent in six Cinerarias, admirably managed—one (Lady Paxton) measuring nine feet in circumference. To these an extra award was assigned. Mr Ritchie, gardener, Parsonsgreen, contributed Azaleas, &c. To one of the Azaleas an extra premium was voted—viz., *Azalea Phœnicea*—a magnificent plant, but somewhat deficient in flower. Mr Gemmell, Hermitage Park, also greatly assisted the general display. A specimen of *Erica melanthera* in this collection received the encomium of the judges. We must not

omit to mention a beautiful bouquet for a bride, composed entirely of white flowers, and remarkable for its chaste elegance, from Mr Buck, Covent Garden, extra award.

Mr Laing, so well known for his successful cultivation of the Rhododendron, among others of his cut specimens, sent in "Bianca;" this was highly commended, and received an extra premium. Mr Laing's contribution to the general show formed no small item in its effectiveness. Mr Blair, gardener, Mavisbank, among his other plants, had a fine example of *Erica hyemalis*; to this also an extra award was made. Mr Patterson, gardener, Millbank, sent *Rhododendron ciliatum*—a difficult variety to deal with commonly, but easily managed, as would appear, by Mr Patterson; also an extra award. Mr Lockhart, gardener, Arniston, sent a splendid specimen of *Pultenaea subumbellata*; this was one of the finest plants in the exhibition, extra award. Mr Gavin, gardener, Hopetoun House, who is so noted for his cultivation of the Pine Apple, even at this season was able to produce five cut Pines, and one plant with fruit in pot. It would have been difficult to have found five at this season to equal them; extra award. The Market Gardeners' collection did not surpass the Mushrooms sent by Mr Gordon, gardener, Niddrie House; extra award.

It has often been said that Grapes can be had all the year round—every day of the year in fact; the honour of producing these, and in excellent condition, was however, confined to Mr Baxter, gardener to Sir William Gibson-Craig, Riccarton. To these, most properly, an extra prize was assigned. Fine Mushrooms were also sent by Mr Baxter. Dr Knapp, of Inverleith Row, sent a small but interesting lot, consisting of *Scilla Siberica*, *Iris reticulata* (a perfect gem), and White Dog's Tooth Violet; to these an extra award was made. C. K. Sive-wright, Esq., Cargilfield, had 70 Hyacinths, *Primula Simensis*, *Rhododendron*, *Epacris Christisoni* (very well bloomed), &c.; also an extra premium. Mr Thomas Handasyde, Glen Nurseries, Musselburgh, supplied a very interesting group of rare Conifers and other plants, including a fine specimen of *Thuja gigantea*. Messrs Ballantyne & Son, Dalkeith—from this firm came a collection of Hyacinths and Coniferous plants, among the latter being a good plant of the female variety of *Cephalotaxus Fortunei*. Messrs Cunningham, Fraser, & Co.—a collection of fine Hyacinths, *Rhododendrons*, &c. Mr Methven, Stanwell Nurseries—a collection of Hyacinths and other plants, cut *Rhododendrons* and *Camellias*. Mrs Carstairs, Warriston—a fine collection of Hyacinths. Messrs Wright, Renwick & Co.—a general collection of miscellaneous plants. Mr Douglas, Rosebank Nurseries, a large assortment of fine plants in flower, including Hyacinths, *Rhododendrons*, Tulips, &c., &c. Mr Stark, in addition to his display on the table reserved for him, had numerous plants in flower in the body of the hall. Messrs Young & Mackay, Newington, numerous specimens of fine cut *Camellias*. Mr Charles Alexander, Larkfield Nursery—fine Hyacinths, and well-flowered *Rhododendron* in pot. Messrs Dickson & Sons, Inverleith—a large number of admirably-grown Hyacinths, *Camellias* (including a good specimen plant of *Imbricata* in pot), *Epacris*, &c. Messrs Downie & Laird, West Coates—a fine lot of well-managed Greenhouse Plants, Hyacinths, &c. Mr Young, South Bridge—a collection of plants, including well-grown Hyacinths. Our space will not allow of our giving a detailed description of the model of a gas apparatus for heating greenhouses, forwarded by H. Craigie, Esq., Falconhall. It was highly commended by the judges, who considered it likely to prove a most valuable invention. Mr Miller, St Andrew Street, added much to the ornament of the hall by furnishing a beautiful display of ornamental vases, flower pots, bouquet holders, &c., made of terra cotta and china. The designs in many instances were quite novel; these were much admired. Mr Raeburn, architect, furnished several designs for different descriptions of Horticultural erections, which were much appreciated. Designs of small Greenhouses for Amateurs, were also furnished by Mr Robinson, Canonmills. Mr Douglas, a model of an Auricula stage. Mr Henderson, gardener to the Duke of Athole, Dunkeld, exhibited a large number of his patent Brooms. Highly commended; extra award.

The tables placed under the gallery for the purpose of affording space for the display of gardening implements, seeds, drawings, &c., were filled with great taste by the following nurserymen:—Messrs Dickson & Son, Hanover Street; Messrs Wright, Renwick & Co., Leith Walk; Mr R. Stark, Princes Street; Messrs Downie & Laird, Frederick Street; Mr Charles Alexander, Register Street; and Mr R. T. Mackintosh, Victoria Street. Messrs Ballantyne & Son, Dalkeith, exhibited a number of Implements of American manufacture, remarkable for lightness and beautiful finish. We have not space to particularise the very great variety of useful and ornamental articles exhibited by the above firms: we must be content to say that almost

all known implements were represented, and that the general appearance of the tables reflected great credit upon those who had the charge of fitting them up. These tables were crowded during the greater part of the day by the public.

On the whole the exhibition was pronounced by all who witnessed it the finest thing of the sort ever seen in Edinburgh. The hall was thoroughly well filled; but had it not been for a delay of the Leith steamer at Rotterdam it would have been further enriched by a display of between eighty and ninety Hyacinths, and twenty-four varieties of Tulips, grown by Messrs J. D. Zocher & Voorhelm Schneevogt, of Haarlem.

CALENDAR OF OPERATIONS FOR APRIL.

VEGETABLES.

The weather during February and March has been very favourable for carrying on all sorts of garden operations, and it is to be hoped no delay has taken place in getting the principal crops under the care of mother earth—if so, however, no time should be lost; in gardening matters delays are dangerous, and it is of great importance digging and sowing when the soil is in a comfortable state. These are facts that almost every one knows, but frequently are not put in practice. That sly rogue—procrastination—is the cause of much mischief. *Seakale* and *Asparagus* should be planted as soon as possible. It is safe to have plenty of both as they are very useful. A sowing of *Peas* and *Beans* should be put in for a succession to those sown in February. I am creditably informed that *Lord Raglan Pea* is a most excellent sort. A friend told me he saw it growing last year in the neighbourhood of Dundee. I will give it a fair trial, and report its good qualities, if deserving. I still cling to *Lynn's Dwarf Marrow* for the principal supply. *Celery*, for a full crop, should be sown under glass towards the end of the month, same time a little out of doors. *Broccoli*, *Brussels Sprouts*, and others of the same family should be sown middle and end of the month; it is difficult to get those seeds true. I have now abandoned *Maule's Broccoli*; the *Penzance* variety comes in two or three week's earlier, and equally hardy. Sow *Spinach*, *Beet*, *Carrot*, *Parsnip*, *Salsafy*, *Scorzonera*, *Parsley*, and a supply of *Salad* material. As soon as the weeds make their appearance, run the hoe through them; an early attack upon them may save a good deal of labour for the future, and makes every thing more eye sweet, and more favourable for successful results.

FORCING DEPARTMENT.

PINES.—Early started plants will now be out of bloom, and should have an increase of temperature—from 70° to 75° during mild weather by night, with 10° or 15° more with sun heat; also increase the atmospheric moisture, and shut up early in the afternoon, charging the air with humidity, and sprinkling the plants over head with tepid water, and occasionally clear soot water. Keep up a steady supply of water to the root, with alternate waterings of rain water and liquid manure—of course such highly stimulating treatment as this must be modified by the state of the weather. In bleak cold weather a less degree of heat, and less moisture in the same ratio must be observed, to maintain a healthy state of progression.

Any portion of the stock which may have been potted late last autumn, and have been kept on the move a little through the winter and early spring, should now be induced to mature their growth as much as possible, with the view of shortly starting for autumn supply, and in order to this, keep the atmosphere drier, and give more air, and a slight decrease of temperature, otherwise, generally speaking, they may disappoint you, and continue to make leaf. Succession plants, shifted early this spring, should have a soft growing temperature maintained about them, with liberal syringing in the afternoons of fine days, and a steady degree of moisture at the root; but in no case use the syringe or the watering pot freely where the plant is not thoroughly healthy and in a free growing state. Give plenty of air on fine days, leaving a little on for the night too in order to get a strong, compact, and fruitful growth.

Suckers potted during winter, that have filled their pots with roots,

should now be shifted on, and more suckers potted. In fact, the surest way to keep up a supply of fruit is to pot a few at intervals the whole year round.

VINES.—Give to Grapes that are colouring a free circulation of warm dry air. This is best accomplished where front air can be admitted to pass over the hot water pipes on entering the house. But the ventilation of early forcing houses is yet in a very imperfect state, and seems to be the last thing thought of by garden architects—so called. A slight circulation of air all night is of vast importance in the colouring of Grapes. It prevents moisture from condensing on the berries and their footstalks. Remove if possible every pot plant from such houses; in fact they should never have a place in these structures. Some gentlemen seem to think that one structure should be a sort of manufacturing machine of all that comes within the name of forcing—just as if Polar bears and kangaroos could be reared in the same den. There is nothing more fatal to the interests of good gardening, than such notions and practices. In houses where Grapes are thinned and swelling off, maintain a temperature of 70° at night, with a steady and bountiful supply of moisture in the air. Shut up early on the afternoon of fine days, allowing the thermometer to rise to 80° or 85° for an hour or two; stir up the fires early in the mornings of cold and changeable weather, so as to be enabled to compete with “squally” fits, harsh winds, which generally prevail at this season. Stop, tie down, and thin succession houses. It is a common practice in some localities to stop the first joint beyond the bunch, which is of questionable propriety. I think a careful attention to this close stopping system will, if carried over a few years, go far to convince that it impairs the general vigour of the Vine, and does the bunch no good for the time being. If Vines were planted thinner and allowed to run two or three joints beyond the bunch every year, we would meet with fewer instances of Vines losing that energy and strength which is in so many cases lost after the first few years of their existence. Still continue to retard, by every means, the latest houses. Keep the house cool as possible, and also the border, shading it from the sun. Young Vines already planted, and that have fairly started into growth, should be encouraged by a brisk temperature, and abundance of moisture. Pot Vines should be shifted on as soon as they fill their pots with roots. Train them near the glass and grow them with plenty of light and air, in order to get a short-jointed and well ripened growth, without which fruitfulness need not be counted on.

PEACHES AND NECTARINES.—These are very much subject to the depredations of greenfly and red spider. The former must be prevented by fumigations of tobacco smoke, and the latter by a moist genial atmosphere and a liberal use of the engine or syringe. Continue to disbud by degrees those that are sufficiently advanced. Also thin the fruit, but never finally till they are stoned; give a good supply of air on fine weather. See that the trees do not lack moisture at their roots. Tie in the young growths as soon as they get sufficiently flexible to admit of it. Do not indulge in much fire heat till the fruit be fairly stoned. Keep the late houses well aired in order to retard them.

ORCHARD HOUSE.—Generally speaking, fruits in this department will be all set. Thin those that require it, but at the same time leave many more—where there are such—than will be finally required. See that they do not suffer for want of water at the root, and ply them liberally morning and evening with the syringe. Give a good supply of air in fine weather, and do with as little fire heat as the weather will possibly admit of.

STRAWBERRIES IN POTS.—Where an abundant stock of these have been potted and room can be spared, it is a famous plan to plant a quantity of them out in pots near the glass, covering the surface of the soil with tiles. This system saves much labour in the way of watering and a heavier crop is yielded. Supply those swelling off their fruit with plenty of water and liquid manure at the roots. Get the remainder of the stock under glass as soon as possible, introducing them into more heat as soon as they set their fruit.

CUCUMBERS AND MELONS.—Sow and plant out succession crops of these. Keep Cucumbers properly thinned out, and do not allow them to bear too many Cucumbers at a time. For further directions, see last month's Calendar.

FLORISTS' FLOWERS.*

PANSIES IN POTS.—Give these all the light and air possible in fine weather, by removing the lights during the day, only be careful to protect from cold, cutting winds, frost, &c.; use weak liquid manure two or three times a week.

PANSIES IN BEDS.—Fill up any vacancies, and see that the plants are all firm in the ground; thin out any that are getting bushy; these put in as cuttings now, root freely, and make fine blooming plants in autumn. If not done last month, top-dress the beds with well decomposed manure, leaf-mould, light fibry loam, and a little sand put through a one-inch sieve, and well mixed before it is put on.

PELARGONIUMS.—As these will now be making vigorous growth, pay every attention to the tying out of the side branches to neat stakes, a free circulation of air is indispensable in fine weather; on no account let them be overcrowded. Give a gentle syringing with soft water once a week to wash any dust from the foliage, and see that the watering is well attended to, so that the roots may be kept properly moist; weak manure water once a week will be found beneficial. Keep down greenfly by occasional fumigation, and shift on young plants as they require it.

DAHLIAS.—Re-pot those struck, and place them in a gentle bottom heat till well established, then re-pot into larger pots, and have them placed in a cold frame, as near to the glass as possible, keep a sharp look-out for snails, &c. Cover well up during cold and frosty nights. Continue to take off cuttings, and if not wanted otherwise, these make fine pot roots for another season.

VERBENAS.—Where these are wanted to bloom in pots, a selection should now be made from those struck last month. Take care to select only such plants as have a robust, healthy appearance. Shift on regularly as they advance; never allow them to get pot-bound; give plenty of light and air to plants intended for bedding out, avoiding frost, cold cutting winds, &c. Pinch the tops of those either for bedding out or pot culture when there is any tendency to be leggy and long jointed.

HOLLYHOCKS.—Continue to take off cuttings, more especially from the finer sorts; and re-pot spring-struck plants in good rich soil. If not previously done, plant out on the first favourable opportunity the most forward plants, for an early bloom. Weak plants, or those struck this spring, will make good progress by being kept in the pots till towards the end of the month. See that they are well hardened off before planting out. Have the stakes all put in before planting.

CINERARIAS.—Continue to shift on any that may be wanted for late blooming. Should any promising seedlings make their appearance, shift them immediately into larger pots. Tie out the side shoots of the larger plants so as to keep them uniform, and be careful that they have a copious supply of water. Shade with the canvas during the day. Get rid of everything like greenfly, by occasional fumigation before the general stock comes into flower. Dust with sulphur where there is any appearance of mildew.

CALCEOLARIAS.—As far as possible let all large plants have their final shift; tie out the side shoots to equal distances; remove all decayed foliage, and see that none suffer for want of water; re-pot young plants as soon as the roots get to the side of the pots; shift on seedlings; give air on all occasions when the weather is favourable. To keep down greenfly recourse must be had to occasional fumigation, as no plant suffers more from this pest than the Calceolaria.

BEDDING PLANTS.—Continue to put in all bedding plants likely to be wanted.

* By Mr J. Downie, of Downie & Laird.

A few over after planting will generally be found useful to fill up vacancies ; re-pot those already struck, so as to have good plants to turn out at the proper time.

FUCHSIAS.—See last month's Calendar.

CHRYSANTHEMUMS.*—If not previously done, pot into five or six inch pots, and set them at the bottom of a south wall on coal ashes, not too thick, turning them round every few days to grow even. Pot specimen bottoms, and plunge into a hotbed where there is a gentle bottom heat ; give plenty of air to encourage short jointed wood. Pinch every shoot towards the end of the month.

POMPONES.—Cuttings must at once be put in, selecting strong short jointed points, and inserting one in each thumb pot, with a little silver sand at the base of each cutting. Water, and plunge in a brisk hotbed. Shade carefully, and when well rooted, repot into four inch pots, and when well established in these, pinch off the tops, leaving a sufficient number of eyes to form the stool.

AURICULAS.†—These plants got fine weather in February to commence their growth. Except some severe weather occurs, the bloom will be in advance of average seasons. Should the show-day appear to be too late for the bloom, shift a sufficiency of plants to a shady situation. As the trusses appear, attend to covering at night. Never allow the plants to flag for want of water ; turn them regularly to keep them from drawing. Keep them clean from decaying leaves, and stir the surface soil when necessary. Flowers intended for show will require to have the smaller and inferior pips thinned out ; do this with a pair of sharp pointed scissors, cutting the footstalk close—as the pips advance to maturity, have them symmetrically arranged, so as not to touch or overlap each other ; this is done by placing bits of soft cotton between the footstalks. So soon as the pips begin to show colour they must be shaded from the sun—a piece of thin white cloth, the size of the sashes, and fastened at the corners, suits well. When the blooms are nearly perfect, remove the plants to face the N. E., where they will only get the early morning sun. If this is properly attended to, a stage of these exquisite flowers may be preserved for a fortnight or longer. During the month, give all the air possible, but keep cold winds from striking directly upon them. Some of the finest flowers for show, have weak stems. To prevent these sorts from having their stems drawn, keep them near the glass ; this is easily done by mounting the pot on a brick and lowering it as the stem advances in its growth.

POLYANTHUS.—During this month these plants require the same treatment as the Auricula.

TULIPS.—Keep the surface soil well stirred ; allow no weeds ; protect from frost, hail, and cold rain. Allow them to have all the warm showers that may fall during the month.

RANUNCULUS.—These plants will begin to show above the surface during the first week of this month. As they make their appearance they lift a clod of soil on the summit of the young foliage, go over them once a-day, lift off the clod, break it in the hand, and place the soil carefully about the neck of the plant. So soon as the plants are up, stir and break the surface soil fine, to the depth of an inch or so, and keep it close about the plants, so as to exclude drought. This work is done well and expeditiously, by the use of a small spud (not a *spade*). Many persons put themselves to unnecessary toil in performing this operation, by using a large table fork ; this causes them to be on their knees all the time. By the use of the spud a cultivator does not require to bend his back. Trust to rain during the month.

PINKS.—Look well after plants that have been recently planted out, and water them as they require it. Keep the surface of the beds clean, and free from weeds.

* By Mr Laing, Dysart Gardens.

† By Mr G. Lightbody, Falkirk.

CARNATIONS AND PICOTEEES.—Give the compost a final turn over in readiness for potting. While doing so, sprinkle a small quantity of the powder of new slackened lime equally throughout the mass to correct any acidity, and destroy the worms that may be among it. Take advantage of the first fine weather, and begin to pot out. See that the drainage in the pots is perfect; fill up to within a couple of inches of the top, make a hole in the centre the size of the ball. Upset the store pot, with the plants carefully in the hand. Rub away any sour soil from the surface of the ball, taking care not to injure the fibres. Place the ball with the plants in the hole, and fill up to about an inch from the top of the pot, and have the lower leaves of the plants free from the soil. Press the soil moderately tight about the plants. With respect to the size of blooming pots, 9 or 10 inch pots suit well for pairs, and when three plants are planted, a size larger. It will be requisite to guard against severe weather for a time. Any sort of protection will do, such as inverted flower pots, bell glasses, or sashes, during the night over the plants. Plants of straggling growth will be the better of temporary support, to prevent their being broken over by high winds. In dry weather they will require a regular supply of water: give the water in the morning till all danger from frost is past.

NOTICES TO CORRESPONDENTS.

P. SANDERSON.—The Shrubby Calceolarias grow equally as well in pots as the Herbaceous sorts, and are not so liable to disease. Try the following and you will not be disappointed:—

Admiration.
Golden leap.
Youave.

Camden Hero.
King of Sardinia.
Eclipse.

Golden Chain.
Orange Boven.
Amazon.

A FIFESHIRE FLORIST will find 8 inch pots quite size enough to grow his Pansies in. Nothing is gained by having them larger. Yellow Model is probably the finest Yellow out.

D. FLEMING. - Get McIntosh's Book of the Garden.

FERNS.—Being a contributor to your periodical, I have taken the liberty of sending 4 Ferns, and should feel obliged by the names in the next number of the *Scottish Gardener*. Please say whether stove, greenhouse, or hardy.—W. T.—[So far as we can make out, Fern No. 1 is *Asplenium bulbiferum*; it requires a moderate temperature. Fern No. 2, *Polypodium vulgare*, grows in the open air, or a cold frame. Fern No. 3, a cut-leaved variety of *Polypodium vulgare*, grows in open air, or cold frame. Fern No. 4, *Pteris serrulata*, requires moderate heat.]

J. K. HERTS.—The Strawberry leaves seem to have been scorched by the sun. They have been forced and placed near the glass of the hothouse, and after watering, the sun has burnt them. There may be also an incipient fungus of the genus *Uredo* or *Aecidium*, at some parts of the leaf. The sun-burning is the chief thing.

SUNDEW, DROSEIRA ROTUNDIFOLIA, AND LONGIFOLIA — It will be obliging any of your correspondents can inform me where plenty of the above plants can be got on any of the bogs or moors near Edinburgh.—A CONSTANT READER, Murrayfield.—[*Drosera rotundifolia*, or Sundew, is common in Ravelrig Bog, and in marshy ground on the Pentland Hills, &c.; *Drosera anglica*, and *longifolia*, are not found near Edinburgh. They are met with in the west and south of Scotland.]

VINERY.—Being about to erect a small Vinery, I shall feel obliged by your informing me in your next number of the *Scottish Gardener* what kind of Vines I should plant, and the number of each. The house will be 24 feet long and 11 feet broad, and 11 feet in height, and heated with flues. Also, whether the Vines ought to be planted within or without the house; it would also be obliging if you would inform me whether Peaches will thrive if planted on the back wall, and if so, the best kinds for the purpose?—A. [Six Vines will be enough for your house, 24 feet long. Of these let 4 be Black Hambros', 1 Sweetwater, and 1 West's St Peters. If the front of the house is on arches, plant inside, and let the roots run outside as well as in. If not on arches plant outside. If you only grow a Vine rod up each rafter you may grow Peaches on the back walls. Noblesse, Bellegarde, Violet hative, Early Gallande, and Royal George, are all first-class Peaches.

THE SCOTTISH GARDENER.

THE THEORY AND PRACTICE OF HORTICULTURE.

NO. 7.—DEGENERATION IN THE VARIETIES OF FRUITS AND FLOWERS.

(Continued from vol. V., page 375.)

IN a series of papers, in this Journal, during the course of last year, we directed the attention of our readers to Dr Lindley's excellent work, the title of which we have again copied above. As our object was to recommend the book for its real worth, not to indulge in fulsome panegyric, we took the liberty of expressing our dissent from some of his opinions, and more particularly from those which relate to the permanence of the races of fruits and vegetables. In our numbers for November and December, we stated, at considerable length, the reasons which induce us to hold so much of the theory of the late Mr Thomas Andrew Knight, as affirms the *tendency* to degeneration in these varieties of plants. In numbers 4, 5, 7, and 13 of the *Gardeners' Chronicle* for this year, we have been honoured with a series of replies, we presume from the pen of the accomplished editor himself. As Dr Lindley has adduced little new or important, in the way of evidence, and certainly nothing cogent in the way of argument, we were disposed to let the matter rest, feeling assured that those who might carefully and candidly study both sides of the question would have no difficulty in coming to a right conclusion. It has, however, been represented to us, that it would be respectful to Dr L. to notice his replies; and, therefore, as we are desirous of showing him every possible mark of respect, we have resumed the subject for a little. The reader will be good enough to remember, that it is of the nature of a rejoinder to be critical; that is, it is rather a weighing of arguments, than a

re-statement of them. The general discussion of the question may be found in our concluding numbers for last year; and to these we would earnestly request those interested in the matter to turn.

With all deference, we must say that Dr L.'s first and second notices of our humble labours were so feeble, that along with some of his other "Northern friends," we thought it would have been better that he had not noticed us at all. It almost seemed that lack of matter for *leaders* at a dull season, could be the only motive for his taking up the subject in such an ineffective way. At length on Feb. 14 came forth an article, which, for dash, and *verve*, and address, as to what it touched, and what avoided, would have done honour to one who had won his editorial spurs in the columns of the *Times*. His concluding reply, March 28, is marked, though perhaps not quite so strongly, by the same qualities. Dr L. is evidently cunning in fence. He can ignore an argument; he can assail a position which is not defended; and he can seize an opponent's illustration, and, extending it beyond its legitimate application, can throw it back into his face like a splash of water. Of these, and other furtive processes of argumentation, as logicians call them, it would be easy to find striking instances in his replies. We shall begin with dealing with two of these, as involving important points in the discussion.

We have said that Dr Lindley can ignore an argument. This is indeed a common enough practice with those who have nothing to say on a particular point; and Dr L. indulges in it repeatedly: but it is rather too much, when an assertion has been answered, or attempted to be answered, to repeat it, with the remark, that "it is admitted on all hands." In his volume, Dr L. affirms that species and their subordinate varieties are physiologically the same, and, *therefore*, as the species are eternal, the varieties are eternal too. He may not have put the argument in this syllogistic form; but this is the use which he makes of it: and of course if that use is valid, nothing more need be said. In p. 369 of our volume for last year, we showed that though species and varieties may be *physiologically*, and we now add *chemically*, the same, *i.e.*, composed of the same or similar aggregations of cells and tissues, and of the same chemical substances, they are *constitutionally* or *pathologically* different. They are not the same in hardness and health, that is, in the very points with which this discussion is concerned. We instanced as proofs the common China Rose, and its varieties the Tea Roses; we mentioned the names of certain Apples and Pears; and we could now load our page with a dozen of other examples. We submitted, therefore, that the principle of identity maintained by Dr L. fails as to the purpose for which he employs it. He, however, ignores our argument altogether. We now propose an *experimentum crucis*, a decisive test. Let Mr Rivers be requested to plant on the damp ground described by him in the

Gardener's Chronicle, Dec. 13, 1856, two rows of trees, one of the common wilding Crab Apple, and another of Golden Pippin, Ribston Pippin, Nonpareil, &c.—let them stand, with common orchard treatment, for ten years, *i.e.*, without transplanting or root-pruning; and then let the result be fairly reported. We are confident that such report would settle the question of the constitutional identity of species and varieties. Meanwhile, we beg to say, that our position is beyond the range of this great gun of Dr L.'s, for another reason already stated, but also ignored, *viz.*, that the natural species are propagated by seed, and the varieties by grafting or other abnormal processes, and therefore no safe conclusion can be drawn from the one to the other.

Again, we said that Dr L. has assailed a position which was not defended. We stated repeatedly that we had undertaken to maintain only so much of Mr Knight's theory as affirms the *tendency* to degeneration in varieties of fruits and vegetables. Dr L. assumes throughout, that we accept of the whole of Mr K.'s theory, and directs a considerable portion of his argument against those parts of it, respecting which we intimated our doubts. Such procedure is not very consistent with common fairness. When a writer is contending not merely for victory but for truth, he should launch his polemic against the form of the error, or supposed error, which exists in his own day. It is quite true that we stated the whole of Mr Knight's theory, chiefly for the information of those of our readers who might not be familiar with it, but also in the hope of preventing those misrepresentations of it, which have been too common of late, and from which, we are sorry to say, Dr Lindley can no longer be vindicated, as, time and space permitting, we could easily show. If our readers will turn to the commencement of the article in the December number of last year, they will find the theory explained at considerable length both in its grounds, and in its conclusions; and we would earnestly press this suggestion on those who have not derived their knowledge of Knight's opinions from his own writings. The following abridged statement may be given here:—(1.) There is a tendency to degeneration and extinction in the varieties of fruits and flowers; (2.) there is what may be called a common life in all the individual plants of the same variety; and, (3.) the life of a variety of Apple is about 200 years, but is capable of being prolonged by grafting, &c. to about 600 years; while the duration of the varieties of Pears is probably twice as long, *viz.*, 400 and 1200 years respectively. We introduced the express caveat that we had undertaken to defend only the first position; and that we declined to have anything to do with the others, not that we had aught to say against them, but because they appeared wholly theoretical or conjectural. Probably we needed not have been so scrupulous about the *second* point, *viz.*, the idea of a common life in a variety, seeing that is merely a mode of conceiving the facts, and is not altogether peculiar to Mr Knight. Even the younger De

Candolle, one of his opponents, admits, "que la separation d' une partie de végétal ne crée pas, dans un certain sens, un nouvel individu;" that is, propagation by subdivision does not, in a certain sense, create a new individual. *Geog. Botanique*, p. 1079. As to the *third* position, we doubted, and still doubt, whether Mr Knight had sufficient data on which to found his numerical estimates. Perhaps, however, it is only just to him, to suppose, that he employed his figures, in the way of conjecture, in order to shape out his theory to the imagination of his readers. Possibly too his approximations may turn out to be not very far from the truth after all; still we have no evidence that they will. Only, of this we are assured, that were he now alive, he would say to Dr L. "put forth your vigour, not against my guesses, but against what I account my experimental results;" and if Mr Knight was entitled to say that, how much more are we entitled, who do not hold Mr K.'s guesses at all.

Dr Lindley has assailed a position which was not defended; but we do not think he has taken it. He finds indeed Mr Knight's 3d conclusion to be self-contradictory. "If races supposed to be dying, because they had in the beginning only a given span of life, yet nevertheless do grow with renewed vigour, under new influences, and thus extend their existence to 600 years, or, as we may otherwise say, into a limitless future, it seems to us clear that they had not at the beginning only a given span of life. The two statements are self-contradictory and irreconcilable." *Gardeners' Chronicle*, p. 100. Now, it humbly appears to us, that the contradiction exists solely in Dr L.'s unwillingness to look at the matter in a proper point of view. Let us put the case thus:—The first Ribston Pipin tree, which was originated by semination, was endowed with a certain *vis viva*, an amount of life, fitted to last 200 years—in point of fact it did not last quite so long, but that was partly owing to accident—and had there been no artificial processes of propagation, it would only have been one tree, and had the life of that one tree. But by the processes alluded to, the life is lengthened out, as Mr Knight would conjecture to 600 years; or, as Dr Lindley would equally conjecture into a limitless future. Which conjecture is right must be determined by experience, and experience alone. To say that the former conjecture is self-contradictory, and that the latter "is consistent with physiological certainty," is just one of those bold ex-cathedra assertions, in which the leadership of such a paper as the *Gardeners' Chronicle*, must sometimes tempt a necessarily hasty writer to indulge.

But contenting ourselves with these illustrations of the manner and spirit of Dr L.'s argumentation, let us attend to what he has to say against the first position of Mr Knight—that, namely, held by ourselves. And first as to his facts: surely we might expect from a man of his scientific and literary resources such an array as might utterly confound and overwhelm us. But no; his proofs in this department are only few, far-fetched, and little to the purpose. We

shall give the whole of them, a little abridged, but as much as possible in his own words.

1. In reference to Pears : "It is a recorded fact that the Grand Duke Cosmo III. of Tuscany imported into Italy, somewhere about 1680, a Pear at that time famous in Portugal, under the name Dorice. Although the age of the variety when it was brought into Italy is unascertainable, yet we may fairly suppose that by this time it is 250 years old, but we nowhere find that it has degenerated."—*Gardeners' Chronicle*, p. 68. Again citing the beautiful *Jardin Fruiter* of M. Decaisne—"Of the sorts figured by him, the Arnadotte was described by Merlet in 1675; the Bellisme d'hyver, one of the finest and most healthy varieties known in France at the present day, the glory, indeed, of the fruiterers' windows, is mentioned by the same author; the Poire d'Angleterre was well known in 1665, and is still commonly sold by the hawkers in the streets of Paris; the Poire de Madame has the same date; but none of these are in a state of decay, and yet they must each be fully two centuries old" *Gardeners' Chronicle*, p. 212.

2. In reference to Apples, there is one solitary item supplied by Mr Diver, a gardener near Canterbury: A friend of Mr D. procured grafts from "the original trees of the Golden Pippin in Hertfordshire." These formed a healthy tree, now 20 years old. From that tree Mr D. grafted an espalier 10 years ago, which at the end of 6 years was healthy.—*Gardeners' Chronicle*, p. 194.

3. In reference to Vines: Besides the enormous Vines mentioned by Pliny or those which our officers found the other day in the valley of Baidar, Professor Targioni-Tozzetti mentions certain Vines—one which two men could not embrace; another $5\frac{1}{2}$ feet, and two others each 5 feet in circumference.—*Gardeners' Chronicle*, p. 68. Again citing the *Ampelographie Universelle* of Count Odart: "It appears that the variety now called Pineau was known in 1394, when it was named Pinoz in the *Ordonnances du Louvre*. Don Simon Roxas Clemente, the learned historian of the Vines of Andalusia, says that there still grow at Rias, in the province of Granada, Vines that were planted in the time of the Moors, and that they differ nothing from others planted in modern times. The same writer is also of opinion that the Cornichon of Paris has preserved its peculiarities through all time; upon which Count Odart remarks that it was described six centuries ago by the celebrated Arabian author EBN-EL-BEITHAR, under the name of Cadin Barmak, or lady's finger, as it is called in Asia Minor."—*Gardeners' Chronicle*, p. 99.

Such, then, being the amount of new evidence produced by Dr Lindley, it now remains to make a fair estimate of it as bearing on the question before us. Adverting to the facts relative to the Pears, a reasoner, who had accepted the whole theory of Mr Knight, would say at once that these facts were not at all inconsistent with the theory. The oldest instance is estimated only at 250 years of age, and that is little compared with Mr Knight's common life of 400

years, to be extended possibly to 1200. It is still less compared with Dr L.'s mythical age of the Autumn Bergamotte, and Downing's equally fabulous age of the Jargonelle, each amounting to 2000 years. For ourselves, who hold only the principle of a *tendency* to degeneration, we have to say that the Pear is admittedly a long-lived tree, and it is nothing surprising that at the age of 250 years, decline had not become perceptible. We should like, however, to have special evidence on this point. In a rapid view which we recently had of the first Cahier of Decaisne's admirable work, we did not observe that he said anything about the health of the sorts which he depicts. On Dr Lindley's own showing, "M. Decaisne assures us (*Comptes Rendus*, Dec. 22, 1856) that he has been unable to find any satisfactory evidence to show whether the races of fruit trees do, or do not, in course of time degenerate."—*Gardeners' Chronicle*. p. 212. M. Decaisne is evidently a candid man, not carried away by the dicta of physiologists; and the question which we are considering does not appear to have received much attention in France. Upon the whole, we submit, that the new evidence in the matter of Pears, amounts to nothing as against the principle of degeneration.

Mr Diver, it must be admitted gives us some new information, viz., that the original Golden Pippin trees exist in Hertfordshire—perhaps he means Herefordshire—but whether the one or the other, the statement does not give a high idea of his accuracy in regard to facts. He tells us, moreover, that a friend of his has a healthy Golden Pippin tree, 20 years old; and that he himself grafted from it an espalier tree 10 years ago, which, for aught he can tell, is still healthy. What do these two facts come to? Why, to this—that the Golden Pippin is capable of a temporary restoration, in a genial climate, and fine soil. To neutralize Mr Diver's experience, gathered in 20 years, from two trees, it is sufficient to oppose to it the experience of Mr Masters, at Canterbury, covering double the period, and embracing thousands of trees. We were about to cite Mr M.'s evidence, as given partially in our November number, when the *Gardeners' Chronicle* came to hand, containing a letter from the same gentleman, which, we think, settles the matter conclusively, so far as the Golden Pippin is concerned. We shall take the liberty of transferring it to one of our subsequent pages, and we request for it our readers' special attention.

With regard to the Vines, we are very much disposed to say of them what Dr Lindley says of the Red Streak Apple—"they are little known to us, and we have no evidence about them." The Vine has always seemed to us a mysterious plant, one *sui generis*. We should like however, to have questioned Professor Targioni-Tozzetti, and his grandfather too, a respectable old gentleman doubtless, much addicted, probably, to the perusal of those writers, whom M. De Candolle calls the authors of the Renaissance, viz., Dalecampius, &c., of whom it appears we are too negligent in this country. Count Odart also is great in that obscure field; and great, too, in the more ardu-

ous fields of Spanish and Arabic learning. Alas! we have not seen even the *Ampelographie Universelle*—but we learn from M. De Candolle that it contains a very strange theory, concerning the origination of the present varieties of Vines, viz., that they have been produced not by the sowing seeds, for the Romans did not propagate Vines in that way, but by the slow and gradual change of the old varieties, continued by cuttings, as they stood here and there, in the Vineyards, of the wine-growing countries. Somehow or other, the birds at that time did not drop the seeds of the Grapes in the hedges as they do at present, in the south of France and Italy, and as they disseminate Gooseberry and Currant plants with us. But admitting all the facts asserted by these very learned people, it remains to be asked how do they tell against us? Our reply as to the Pears needs only a little altering—the Vine is an extremely long-lived plant. Whether it is susceptible of degeneration or not, has yet to be proved by experience, as Dr Lindley himself very well knows. After saying that some of the aged Vines, mentioned by the Italian professor, might have been planted by Pliny himself, he continues:—"We presume they preserved to the last the inherent qualities of their race. Cuttings, however, not having been taken from these plants, we have no proof that their peculiar properties were susceptible of further extension; our own *opinion* is, that they would have been found unchanged; the *opinion* of our Scottish friend is, we presume, the other way."—*Gardener's Chronicle*, p. 68. Undoubtedly, if a fact or law in nature is to be decided by an appeal to authority, no one is better entitled than Dr Lindley so to decide it. What are we compared with him? When we turn to the title page of his volume, we find his name succeeded by a train of honorary affixes, like the tail of a comet, besides a penumbra, or rather pen-aurora, of &c.'s. We, on the other hand, are only Dr L.'s "northern friend,"—anonymous at present, for no bad reason, we hope—our real name, which we trust is already known to Dr L., is only a very obscure one, without a single affix, much less an &c. "We are very humble" as one of Dickens' characters keeps always saying, and we are almost ready to make our bow of absolute deference and submission. "Upon my honour," said our Italian teacher long ago, "there is first-rate poetry in Petrarch;" and we took his word for it. We will take Dr Lindley's word too, if he will assure us upon his honour that Vines do not degenerate. Only he must not abuse our admission—he must not take it as a surrender of the whole argument. That he will be disposed to do so, is evident, for he has already said—"if any one case (of the longevity of Vines) be reduced to a certainty, we conceive that the doctrine of the degeneracy of races receives a fatal blow."—*Gardener's Chronicle*, p. 68. Here we protest our submission ends; we are no longer before the Doctor's chair of authority, but on the free arena of argument, and there we will return, as we are able, blow for blow. It is admitted by Dr L. that

the probability of the extension of the qualities of the aged Vines to their offspring, remains to be decided by experiment; we have in the meantime conceded that extension as a little incense due to his scientific eminence; but then the concession has only to do with Vines, it does not affect the other fruits commonly grown in this country. It is allowed that Dr L. has established the permanence of *Triticum repens*, the Quicken, among grasses—he has asserted the permanence of the Jerusalem Artichoke among culinary vegetables; and we have not thought it worth while to battle that point with him; and now we shall suppose that he has established the permanence of Vines. What then? We submit that his conclusions, such as they are, affect these three species alone, and that they leave the question of the Golden Pippin, &c., exactly where it was. Perhaps here again Dr L. will contrast his *opinion* and our *opinion* as he did before, but we cannot defer to his authority this time. To be successful on this point he must establish the principle of *true in one thing, true in all*. False in one thing, false in all, is a very good rule for estimating the moral value of evidence in a court of justice, but even there it cannot be made absolute, for “a liar of the first magnitude” may speak the truth, when it is for his advantage to do it. But the maxim, *true in one thing true in all*, would lead to the strangest results in science. Aristotle, one of “the greatest of those that know,” was right in one thing, in physics—nay, in many things; but he was not right when he said, that nature abhors a vacuum. Goethe, we shall say, was right in his Morphologie; but he was not right, when he explained the tides, by saying that the earth, like a great beast, twice a day sucks in and spues out the waters of the ocean.

Dr Lindley, we are proud to say, has not denied one of the facts which we have alleged in proof of our views.* With the greatest

* A writer in the *Florist* &c. for March and April has controverted some of our facts relative to Apples and Dahlias. In reference to Apples, we beg to state, that when we said that the Ribston Pippin was almost everywhere infected with canker, we had specially in view the sphere of our own observation, extending, say from the Tees to the Tay; we did not mean to affirm that there are no healthy trees throughout the empire, or even in the more limited section of it with which we are familiar. In our own garden we have two wall trees of this sort, at least twenty years old, which, by various expedients we have kept comparatively healthy hitherto, but which are beginning to show signs of disease. We fully believe what the writer says about his old Ribston Pippin trees; but we equally believe, both from the excellent letters of Mr Masters, of Canterbury, and from other evidence in our possession, which we shall publish as soon as it is completed, that in regard to Apples and Pears, the proofs of degeneracy are exhibited more strongly by young, *i. e.* recently grafted, than by old trees. At all events, no extensive and candid observer will say that the Ribston Pippin is not one of the infected sorts. That canker, in that variety, is not confined to Scotland, is evident from a pamphlet on that disease, by Mr John Pearson, near Bewdly. “I may state,” says he, “that there is a standard Ribston Pippin here, 25 feet high, diameter of its branches 36 feet, that is but slightly affected with canker, while there are dwarfs of the same kind, which are seriously affected by it.”—p. 11. As to the Golden Pippin, the same remarks might be made, only more strongly, and we would take the liberty of recommending to the writer in the *Florist*, to make sure that he has really got the genuine old sort. There are a great many kinds of Golden Pippins, and some of them tolerably

candour he has admitted them all, but he endeavours by laboured explanations to show that they do not admit of the interpretation which we have put on them. "It is an acknowledged fact," he says, "that the Golden Pippin Apple, the Redstreak, the Golden Harvey, and others are now for the most part in a state of decay, that the Herefordshire orchards no longer know their once familiar faces, and that attempts to re-invigorate them in England fail. The fact is admitted; but what is the inference? Our *Scottish Gardener* says they are worn out and irrecoverable. We say irrecoverable, perhaps, but not necessarily worn out. We beg it to be observed that we have no recent example of this degeneracy. All the cases quoted or quotable are those of varieties raised long enough ago to have fallen into decrepitude and neglect during that dark time of English gardening which intervened between the middle of the eighteenth century and the beginning of the nineteenth. Our theory is, that during this period fruit trees generally when cultivated as open standards were allowed to run wild and fall into bad health; that when cuttings were taken from them for propagation, they carried disease with them, which disease, acquiring more and more intensity, ultimately exterminated them, except in a few places."—*Gardeners' Chronicle*, p. 100. We must reserve the consideration of this theory of Dr L. to another occasion. Meanwhile, does it not seem strange to our readers that the second half of last century—the age of Miller, and Hitt, and Speechly, and Abercrombie, and Knight himself, for his theory was elaborated before 1800—should be described as a dark time in English horticulture? Is it not unaccountable, if there be no constitutional distinctions in varieties, that some of them came through that dark time unscathed, and others irrecoverably ruined? And how was it, too, that the Redstreak, Golden Pippin, &c., were nowhere else than in the neglected orchards in the dark time? On the other hand, are there not still many dark places in the land. Doubtless there is abundance of light in the Horticultural Society's Gardens at Chiswick, and in the other centres of horticultural interest, but we are assured by Dr Lindley that the orchards of England, at the present day, are

vigorous. We have known the Yellow Ingestrie, which "grows like a Willow," doing duty for the Golden Pippin. We beg farther to state, that we laid little stress on the evidence from Dahlias, and in fact we partly indicated the answer that has been made to us. We are not singular in supposing that Dahlias deteriorate, as our readers will see by consulting *London's Gardeners' Magazine*, vol. XVIII., p. 526., *Cottage Gardener*, Jan. 20, 1857, p. 279. Certainly the last specimen we saw of the Springfield Rival was a very poor one, but that might be the fault of the grower. We cheerfully take "the word of Mr Turner, of Slough, one of the first cultivators in the kingdom, that the Springfield Rival Dahlia, was as good a florist's flower up to the last, as when first sent out." We will take Mr Turner's word as to any other fact of the kind, but we will take no man's word, not even Dr Lindley's, for a matter which ought to be a conclusion from evidence. We now see clearly enough that owing to the rapid succession of varieties obtained from seed, Dahlias have not time to become aged and to wear out. Some hundred years hence degeneration may possibly be found in them as well as in Potatoes; meanwhile, we hold that the evidence of the Dahlias, like that of Vines, amounts to zero, whether as against or as in favour of degeneration.

no more cultivated than the Oak plantations are ; and if he is right in that, we may certainly expect that recent instances of degeneration will speedily emerge into notice. A communication, with the signature L., in our last number, shows what is taking place in the Pear orchards on the shore of the Frith of Tay.

We hasten to perform a duty, which, independently of the request addressed to us, we had resolved to discharge, viz., to contradict the conjecture in the *Florist* of March, that Dr Balfour, Professor of Botany in the University of Edinburgh is the author of these papers on the Degeneration of Fruits, &c. The editor of the *Florist* will be so good as repeat this contradiction. In a note to our publisher, requesting this intimation, Dr Balfour writes—"I am anxious that this should be done, as the views are not coincident with my own. I differ from Knight, and agree with Lindley in this matter. I have declared my opinion in my *Class Book*." In a postscript he adds—"I point out every year to my pupils a healthy vigorous Willow which has grown from a cutting taken from a tree in Mr Knight's garden, which tree *was stated by Mr Knight* at the time to be in the last stage of decay from old age. Dr Graham was the party who took the cutting from the tree under Mr Knight's eye." We give this fact, *valeat quantum*, in the meantime, and we may consider it afterwards with some similar facts adduced by Dr Lindley. We are surprised that any one, who has ever looked into Dr Balfour's work on Botany, should have supposed that he had adopted the theory of Mr Knight. Perhaps the book is not so well known in the South as it deserves to be. We confess we were not so familiar with it as we should have been, and the discovery of Dr B.'s views on this subject last October was one of the circumstances which made us hold in our breath for a time. Knowing the omnipotence of names in the horticultural world, at present, we should probably have resiled from the defence of Mr Knight, had we not previously announced our intention to the public. But great is the truth and it will prevail. If truth emerges from the discussion, we shall not regret our bold attempt, even though our own views are not ultimately established. After another paper, in which we shall endeavour to pay the balance of our debt to Dr Lindley, we shall be glad to let the matter drop.

NOTES ON FORCING THE PELARGONIUM.

BY MR D. THOMSON, DYRHAM, HERTS.

IN winter and early spring, few flowers are found more acceptable, either for "cut bloom" or for decorating the show house, than the varieties of what are known as forcing Pelargoniums. Yet it is surprising to find that in by far the majority of instances, such an object at such seasons is scarcely thought of. Were good forcing

varieties not plentiful and easily attained, or their management such as could not well be accomplished with very ordinary means, the omission of a flower so highly prized would not be wondered at.

Having been successful for the last 10 years or more in making use of the *Pelargonium* for cut flowers and the decoration of the conservatory, in most cases from January onwards to the more common season of blooming, I take the liberty of encroaching on your pages with a few practical directions, which may be of more or less service to the inexperienced and unsuccessful, and perhaps the cause of inducing those who have not so cultivated the *Pelargonium* to make a start.

To begin at the beginning. Take your cuttings the first week in May, choosing the side shoots which have not made any bloom up to that time. Such growths I generally find to grow mostly after the main part of the plant is in full flower. Choose, of course, the strongest and shortest jointed cuttings you can get, with fresh and healthy foliage; make the cuttings in the usual way, and insert them singly in large 60's pots, in a compost of half loam and half leaf-mould, with a slight addition of sand, putting a little pure sand round the base of each cutting when dibbled in. When watered, place them in an intermediate house on a shelf near the glass. If kept regularly moist, they will soon root in this position, and as soon as they show roots at the bottom of the pot, shift them at once into 48's, in equal parts of well rotted dung and loam. Pinch out the top buds, leaving three eyes for the plant to start from. They should now be placed in a light airy situation near the glass, where, during very hot weather, they should be slightly shaded for an hour or two in the middle of the day. Never throughout their whole growth subject them to rains or chilly nights, exposure to which is productive of spot. As soon as the young shoots are of sufficient length to allow of their being tied, put a stake to each so as to fix them entirely clear of each other, but do not stop them again. So soon as the 48's pot is tolerably well filled with roots, shift them into 24's for their blooming pots. By the beginning of autumn you will be able to see the prospect of reaping a crop of flowers at pleasure, for the flower buds will be discernible—in the most early varieties especially—in the points of each shoot. They should early in autumn be placed in a dry house on a shelf near the glass, in a well ventilated position, but not one subject to cutting currents of air. It is of vast importance for all *Geraniums* to be wintered in a dry atmosphere, and most especially so for early ones like those of which I am treating, being so far advanced; if they suffer from the effects of a moist, stagnant atmosphere, there is no chance of getting them round again. I know a nurseryman who is a most successful and extensive grower of these sorts for the London market, selling some 25,000 every spring, and he always finds that the drier the atmosphere he gives them in winter, the more free of spot, &c., and *vice versa*.

The time to introduce them into heat must be determined by the

time they are required in bloom ; if required say in January, they should have a little warmth all winter, and if got forward as directed in autumn, they will flower by the beginning of April, and sometimes in March, in a greenhouse temperature.

When done blooming, the stock should be well ripened by the middle of June, and cut down ; and as soon as broken, with a few leaves formed, shaken out and re-potted in smaller pots, and treated in the same way as the first year, never stopping at all. They will make fine bushes by autumn.

The following varieties are excellent for forcing. Those marked * are the earliest, and stand heat without drawing the best :—

* Gauntlet.
* Alba Multiflora.
* Washington.
Alexander the Great.
Boul de feu.

Forget-me-Not.
Duke of Cornwall.
* Bianca.
Queen of May.

These are all old varieties which are found to stand forcing better than any more recent sorts, except a new one ("Blanch Fleur"), of which Messrs A. & S. Braid, florists, Hendon, Middlesex, possess the entire stock. To my knowledge this is a splendid forcing variety, and "draws" less in heat than any I have yet seen, and is as free a flowerer as Alba Multiflora. I saw it in bloom last March, and it was scarcely 16 inches high. It is a pure white, with a deep pink spot on the upper petals.

It strikes me that some of these large trussing French varieties lately introduced will answer for forcing. Judging from their strong and free blooming character, I mean to try them this season. If these can be got to force well, nothing could surpass them for cut bloom and conservatory purposes.

HINTS ON RECLAIMING UNPRODUCTIVE FRUIT TREES ON WALLS.

BY MR A. FOWLER, CASTLE KENNEDY.

THE object for which we grow fruit trees on walls is to produce in greater perfection many of the less hardy and more valuable kinds.

In how many gardens do we find the wall trees in a very unproductive state ? I am well aware that many of my professional brethren, both in large and small places, have not the means at their command to remedy this evil ; still, much can often be done by gardeners properly explaining to their employers the *cause and the cure*.

When trees are observed to run much to wood, producing large, ill-ripened shoots, it may be taken for granted that something is wrong at the roots : either the border is too rich, or the roots have pene-

trated into a cold, damp subsoil, or the border wants drainage. Trees often become unhealthy from the soil in which they grow being old and exhausted of the particular chemical ingredients essential to their healthful development. As soon after the fall of the leaf as possible, the state of the roots should be ascertained.

Where the border is thoroughly dry, and the roots not having got into the subsoil, trees can often be brought into a productive state, by lifting the roots to within three or four feet of the stem, adding a few cart-loads of good turfy loam (a surface pit from an old pasture is to be preferred), and laying them down again, keeping them within ten or twelve inches of the surface; if growing too rank, the lifting the roots will give a check to their over-luxuriance. The fresh soil will supply the necessary food to produce a healthy and productive tree. As the roots extend in future years, additional soil can be added.

If the roots have penetrated deeply into the subsoil, it will be necessary to remove the soil of the border, and lift the trees. The bottom should then be concreted, putting in sufficient drainage above; if not exhausted, returning the soil into the border, adding a portion of fresh loam around the roots when planting as recommended above.

What may be termed proper drainage in the neighbourhood of London, or even in the Lothians, would not be proper drainage in the west or south-west of Scotland, where nearly the double of the rain falls, and where we have much less sunshine. I find in this locality (Wigtonshire), except where we have an open gravelly subsoil, that it is advisable to put into the bottom of the borders 10 or 12 inches of stones, larger ones in the bottom set on their ends, as open as possible, finishing with very small ones on the top, covering with a turf, the grassy side down, before putting the soil into the border. In this way almost all kinds of wall fruit trees produce abundantly in a good loamy soil. In the course of a year or two after being transplanted, if proper attention is paid to pruning, encouraging natural spurs, &c., and keeping the wood much thinner than is usually done, they produce fine strong short-jointed shoots, showing abundance of flower buds, producing flowers at least double the size we often see, and much more certain to set, being better able to withstand the late frosts. This arises from the flowers being strong, and all the organs able to perform their parts; the roots being ready to pump up healthy sap, when the call is made on them for the development of the embryo fruits.

There are few sources of enjoyment more gratifying to the enthusiastic fruit culturalist than an occasional turn round amongst his fruit trees; at this season of the year, especially if they show either presently or prospectively plenty of fine robust blossom. Except in a few favoured instances, this cannot be obtained without considerable exertions; but fortunately, when those exertions are well directed, they do not require to be repeated for many years to come.

SORTS AND THEIR SHORTCOMINGS.

BY DR LYELL, NEWBURGH, FIFE.

ALTHOUGH the title I have prefixed to the remarks I am about to make on a subject which has agitated the horticultural world for many years, and culminated recently in the leading gardening papers, may seem to imply the general question of the duration of varieties of plants, yet at present I intend to confine myself to the Pear alone, and its leading varieties in this quarter; not to detail conjectures but to relate facts, from which any one may draw his own inferences. I am certain that Dr Lindley and those who hold to his views on this subject will be better met by well-attested facts, however few, than by page upon page of theory and conjecture; and if these facts induce me to question so great an authority in horticulture as Dr Lindley, I trust he will permit me to say in the words of the poet—

“Not that I love my friend the less,
But truth the more.”

Newburgh stands on the left bank of the Tay, about twenty miles inland, and is literally inclosed in an orchard of fruit trees, mainly Pears. The ground ascends rather abruptly from the flat on the river side to the hills about a mile distant; the soil of the lower part is a deep alluvial deposit of clay and silt; the higher ground a loam from the debris of the trap rock adjacent. The Pear thrives admirably, producing heavy crops of fine fruit, so that Newburgh Pears are famous for 50 miles round, and command the first price in the market. The fruit gardens and orchards amount to more than a hundred, varying in size from one-sixth of an acre to two acres, and contain trees from one to 130 years old.

I do not intend to go particularly into the history and condition of many of the varieties we grow, but shall confine myself at present to the evidence given by two of our most esteemed and leading varieties—viz., the Lammas Pear or Crawford, and Summer Benvie. I have specially examined the orchards, conversed with their owners, and shall give nearly their own words. Of course it would be useless to go over all the ground; but I make no selection, save in giving notice of a tree more than usually healthy, which would not otherwise have come in, in the ordinary course of the evidence. The Capital letters denote different owners.

- A. 1 Crawford, old and much decayed; had more, but all dead; would not plant a young Crawford, it would not thrive.
- 5 Benvies, mostly aged, somewhat cankered, no use planting young ones; have tried several and failed.
- B. 2 Crawfords almost dead.
- C. Had three Crawfords getting very bad, cut down two, and grafted with another sort; growing very well; planted several young ones; had to throw them out.

- 3 Benvies, all old and bearing, but a good deal cankered ; one of them about 100 years ; young trees canker.
- D. Trees all 35 years old or thereby ; 4 Crawfords all cankered.
- 3 Benvies, 1 just dead ; other 2 going.
- E. 4 Crawfords, all cankered ; 35 years old.
- 1 Young one 2 years ; very full of blossom.
- 5 Benvies (35 years), all more or less cankered.
- 1 Do., 2 years ; free of disease.
- F. 4 Crawfords very much decayed.
- 3 Benvies, two a deal cankered ; one not so bad.
- G. 3 Crawfords, two nearly dead ; one not so bad.
- H. 6 Crawfords, all nearly gone ; has planted about a dozen at different times ; all had to be thrown out.
- 12 Benvies, the old trees cankered, but bearing good crops, those 6 or 8 years planted, more cankered and going ; would not plant any more.
- I. Crawfords all dead and dug out.
- 4 Benvies, one upwards of 100 years old somewhat decayed, but still bearing large crops ; others cankered 14 years old, growing fairly.
- K. 1 Crawford much cankered.
- 1 Benvie nearly dead
- L. 5 Crawfords nearly gone.
- 1 Do. grafted with another sort, growing well.
- 5 Benvies going, but still bearing fair crops.
- M. 2 Crawfords almost dead.
- 2 Benvies beginning to decay.
- N. 2 Crawfords gone.
- O. 20 Crawfords from 3 to 70 or 80 years old, many of them almost gone, the youngest cankered or running up to bloom, don't understand why they don't grow now, and used to grow so well.
- 10 Benvies, some very bad, others less so, but all diseased.
- P. 2 Crawfords 7 years old, beautiful trees, but begun now to canker, and very full of bloom.
- Q. 2 Crawfords cankered.
- 12 Benvies all more or less cankered ; would not now plant a young Crawford or Benvie, as they don't grow.
- R. 1 Crawford nearly dead.
- 5 Benvies, all diseased, but bearing good crops.
- S. 1 Crawford nearly dead.
- 10 Benvies decaying more or less.
- T. 2 Crawfords almost dead.
- 1 Benvie going.
- U. 1 Crawford 5 years old, healthy, but almost every bud a flower bud.
- V. A large young orchard, but no Crawfords or Benvies ; did not plant any because they don't thrive ; most decidedly

should have planted them if they could have been got to thrive.

Such is a specimen of the evidence our orchards furnish of these two fine old sorts of Pears. No early orchard Pear equal to *our* Crawford has ever yet made its appearance, but it will very soon be extinct in this district. The summer Benvie is following, but not yet so bad; it is with us a first-rate medium Pear, and a good bearer; and a curious fact in its history is, that trees planted within the last 30 years or so are more given to canker than the older trees, some of which more than a century old continue still to bear good crops of excellent fruit.

We have a good many trees growing—which had been grafted on Crawford stocks—of the newer sorts, such as the Hessel, Craig's Favourite, and the Duck's Egg; these are quite healthy and bearing well.

I might go over a number of other sorts of Pears that are getting into a similar condition with the Crawford and Benvie; for instance, the Drummond and French Bergamot are about as bad as the Crawford, and the Longueville and Black Achan similar to the Benvie; but the two former are sufficient, I presume, to show that influences are at work detrimental to their health and vigour,—gradually but surely undermining their constitution, and causing decay and death. They used to be healthy and vigorous, but are so no more, and lose them we must at no distant day.

HEAT, VENTILATION, AND AIR MOISTURE IN GARDEN STRUCTURES.

BY MR R. ERRINGTON, OULTON PARK, TARPORLEY.

THE importance of making a due provision for the motive effects and renewing power of fresh air in hothouses is generally recognised, and the necessity of providing air moisture also in a special way is by practical men deemed of equal necessity. At the same time, it must be admitted that a vast number of plant and forcing houses in Britain are open to the charge of neglect in these necessary precautions. It may not be amiss here to remind those who are trying what Burns called their "prentice han'" in the gardening way, of the effects of imperfect ventilation. They may in the first place reflect on what may be frequently observed under a propagating glass, which is, of course, in its way, a kind of Wardian case. Those who have ever handled a cutting pot of delicate and free growing plants must have observed the pale and attenuated condition of the young stock, if suffered to grow awhile after rooting. Here is an illustration of the want of air or ventilation, as it is termed, of the most convincing character; albeit a partial deprivation of light may have had a share in the disaster. Now,

it may be noticed here, that there are two titles in common use amongst gardeners as applicable to the ventilation of houses. "You must give more air," says one; says a second, "You are deficient in ventilation." I am well assured that these technicalities of gardeners are at times a source of discomfort and perplexity to those who desire to handle matters on principle.

There may be three distinct demands in houses as to what is termed air giving; it may be that excess of heat, caused by sudden gleams of sunshine, in conjunction with warm pipes or flues, may require to be parted with, or even excess of air moisture may demand, at least, an exit; but the main purpose, and which is called ventilation, is the chief consideration; and this consists in making such arrangements as will carry on a constant motion and marked change in the interior atmosphere. In most of our garden structures, many are provided in some degree for the ingress of cold or fresh air from the front; this is, or should be, generally at a low level, and, if possible, opposite the piping which heats the interior, that the air, in entering, may be warmed, and, if necessary, charged with air moisture. The back of the house at the highest level has also capacious exits for heated, and, I may add, corrupted air—so far, so good. Now, supposing it a cold March day, and occasionally a glaring sun, the judicious operator has first recourse to his back ventilators, having the fear of a south-easter before his eyes; the front or ingress points are used with much caution. This is simply getting rid of heat; but as the season advances and the air becomes milder, a puff of wind, when mild, will occasionally be beneficial, and then it is that the front ventilators are in high request, as well as back ventilation. But amidst all this, the question of atmospheric moisture assumes much consequence, and the great problem to solve is how to sustain sufficient moisture in the atmosphere amidst such liberal airings accompanied by much solar heat, and of course light.—Let us consider the consequences which generally result from a too arid condition of atmosphere, long continued. "Flagging," or a sort of vegetable lassitude, if I may use such an expression familiar to all who have had to deal with the vegetable world, is one of the evils; the plant or tree is thus rendered more liable to the attacks of insects, or to disease. There is, perhaps, no more fertile source of the spread of certain insects amongst plants, than suffering through drought. This is neither so generally known or recognised as it ought to be, and I would here impress the fact on the minds of all who have not well considered the subject. The exhaustion of the juices through excessive perspiration causes this flagging; the root action can by no means keep pace with the demands of the foliage, and the plant of course droops, or shows similar effects to a shoot cut off a growing plant or tree, and thrown on the ground for a few hours. A repetition of such severe trials causes the sap vessels to become narrowed or constricted as to their calibre, and the whole functions of the plant

or tree become weakened, temporarily if not permanently. How plainly such cases, which are by no means uncommon, point to the necessity for making a due provision for air moisture when the interior arrangements of houses are in course of progress; as also of duly estimating the utility of shades in extreme cases: about the latter I must say a few words shortly. Some people think they have done quite enough when they place a little shallow evaporating pan here and there in a few parts of the house; some indeed provide none at all, and others insist that there is no necessity for them. Whatever degree of success may attach to such houses, the necessity for a liberal provision for air moisture is recognised by all first-rate gardeners; and I cannot remember a single case of complaint by any gardener of having too much within his reach. This at once points to a thorough recognition of its immense utility. I am inclined to the opinion, that in most cases an evaporating cover should accompany one line of piping in a continuous way, or with as few breaks as possible, to its termination. Such evaporators are commonly cast with or attached closely to the piping; and here I would urge a complaint against the spare manner in which some are made. I would have none so shallow but that they would in cases of necessity furnish a twenty-four hours' supply. This would require troughs of nearly 6 inches in depth, and if they were made to flange outwards right and left, they would also present a liberal surface for evaporation. One condition in the case I would here refer to, which is that the evaporating pans may be filled and emptied at pleasure. This is easily arranged where there is a fair supply of water overhead, and will be found superior to any open tank system, as being much more easily adapted to circumstances.

But here it may be fairly asked by those who desire to raise a question—of what use are your evaporating pans, be they ever so numerous or so capacious, in summer when there is no fire? This is, indeed, both a fair and a necessary question, and I put it here in order to have the pleasure of offering a few remarks on shades.

Of course it is very well known that such tender fruits as the Grape require, as a general principle, all the sunlight our northern skies afford. When, however, there are such extreme temperatures as we sometimes meet with during warm summer periods, it becomes a question whether we had not better dispense with a little of the direct solar rays for a few hours in exchange for a less exciting or trying condition of atmosphere. Under such circumstances, albeit the air in the house may be nearly as arid as before, which is doubtful; yet the accompanying conditions are by no means so trying. There can be, therefore, no doubt of the utility of shades of proper character, when properly handled, even to the Vine—than which, perhaps, no fruit tree we cultivate more requires abundance of light—so that in the height of summer, when fires to houses in the day time are almost out of the question, and when by conse-

quence, the piping being comparatively cool, less air moisture is produced, the shade steps in to our rescue; but, be it remembered, with limitations. The most trying period is from 11 A.M. to half-past 2 P.M.; and what is a light shade during this period more than flickering fleecy clouds, as to the well-being of the Vine plants, &c., &c.?

Shading materials, however, of some kinds are made too fine—too close in the mesh. What we require is a somewhat open material, but a sound fabric, so as to admit a flickering kind of light. They should, moreover, be on rollers similar to those employed by the metropolitan nurserymen for orchids, &c.; and, if possible, there should be a pent-house provided at back for them to be rolled under when dry, and not in use. But here it may be observed, as to aridity in the atmosphere, that when there has been a fire in the night, there is always a little warmth left in the piping, so that still a genial moisture proceeds from the evaporating trough; added to which, a small fire lighted each afternoon about three o'clock, will produce an evening moisture in the air of a highly replenishing character. We have also syringing, and the sprinkling of floors, and other surfaces, to assist in producing that mellow and soft condition of atmosphere so very desirable in our houses.

Before I conclude, I may offer a few remarks on the heating apparatus in houses. There is not a more false economy than the having a too limited amount of piping in the interior. This in part occurs through heating contracts, in which but too often the first cost is only taken into consideration. When such is a competency affair, the chief desire of the contractor is to produce a given amount of heat in a given time; the after consumption of fuel is lost sight of for the moment, and this is always a most serious consideration. Hereby is very commonly entailed a continual extra expense on the owner of the gardens, and, in the majority of cases, is concealed from him, but not the less prejudicial to his interests. When a house is so severely limited as to piping, or in other words, heating surface, the fire during all trying weather has to be worked up to its highest pitch—the poker and rake are in frequent request, and these, although necessary instruments, are expensive ones; and it may be affirmed that the less a fire is handled, the less expensive it becomes. What signifies talking about the boiler, its immense capacities, &c., if the piping is short. The boiler may be the first in the kingdom, and yet the house or houses inefficiently heated. We must not judge the heating of garden structures on the same principles as we would a factory concern. They very frequently require rapid combustion, whilst in gardens, not unfrequently the question is how to make a fire that will burn a long time slowly, and require little stirring or attendance. To this end, there should always be a capacious furnace, and the fittings, &c., should be of such make as to give a perfect control over the fire, and to ensure

in cases of necessity a steady combustion for a score of hours or more without further attention.

I would respectfully advise all who are about to heat structures, to look well to these points before they strike a single blow; they may rest assured they are deserving a close consideration.

The relation which heat, air moisture, and ventilation should bear to the amount and intensity of solar light is a question which deserves the utmost care in determining. No man can expect to succeed in cultural matters in a manner worthy of the age unless he in some degree understand the bearings of this affair. In most cases, we can make little real progress as to heat in artificial climates without a certain amount of daily light; and, as certain as heat requires light for perfect development of parts as well as for a proper elaboration of the juices, so it also requires air-moisture, unless the subjects under culture come from some of those extreme climates which are to be found in certain parts of the globe. The products of such climes, however, rarely find a place in our hothouses, or if they do, they constitute but a secondary consideration. To all young gardeners who are emulous in their profession, I would earnestly recommend a closer study still of those laws which govern the vegetable world. When a young man has made himself familiar with them by a course of close consideration, he has a key that will in after-life unlock many a mystery which the untaught or the idler sets down as impenetrable. We live in an age that requires this of us, and has a just right to do so; we may not be mere men of rules but of principles: the reign of empiricism hastens with rapid strides to its termination.

SHANKING OF GRAPES.

THE opinions held in regard to the shanking of Grapes, if viewed separately, are very perplexing, and the remedies suggested have been very much on the quack-doctor system, that is, founded on guess, and applied at random. A writer in a recent Number of the *Scottish Gardener* quotes many of the current opinions, and endeavours to show that we are still as much in the dark as ever. This is so far true; and yet most of those who believe themselves authorities seem disposed to be very tenacious of their own nostrums. One attributes shanking to one cause, a second to another, and so on till we get through a rather long list of reasons, without being a bit the wiser. Shanking seems rather on the increase, and it bids defiance to all our attempts to excel in the production of fine Grapes. Is it then the effect of some unknown cause? No: however much it may affect our self-love, I have no hesitation in saying that it is the result of mismanagement in some way or other, and whether that be at the top or the bottom, at the branches or the root, it is our duty

to discover. We have all something to do, and perhaps most of us have something to learn.

Notwithstanding our boasted experience, and increased scientific knowledge, we are rather apt to be swayed by fashion, and to run into extremes. A few years ago we were much lectured on the advantages to be derived from shallow planting. Many converts were quickly made, and thousands of trees and bushes were planted, so high and dry, that they were placed almost beyond the reach of food and drink. With a light covering of soil, they were fed, as it were, on dry crusts. This is sometimes the case, in raising towards the surface the roots of the Vine; the thing is over-done, and under such circumstances shanking may be the result. Vines whose roots have been laid too high are sure to receive a check in very dry weather; and the most liberal application of the water-barrel may be hardly sufficient to prevent the evil, or to arrest it when it has set in. Roots that are very near the surface must suffer more from the effect of fermenting material laid on them than those which are comparatively deep; because the heat may be so strong as nearly to roast them. And when the covering is withdrawn, the sudden transition often completes the mischief, which shows itself in a plentiful crop of shanked Grapes.

Rules that are applicable for border making and planting in one district, may not be strictly so in another; for instance, in a low locality, where the atmosphere is humid and the soil wet, the border and the roots may be safely kept at a higher level than would be advisable in drier places, where the soil may be light, and the sub-soil porous. The nature of the locality should be considered; and while a due range of allowance should be made, a good medium ought to be preserved. It is better to leave something to nature than to be too artificial in the treatment of plants.

If a new border is made, and too much vegetable and animal matter is put into it; if the loam be strong and liable to become compact and retentive of water, it is a rich, but cold and wet border; the roots will suffer injury; and shanked fruit may be confidently expected.

A Vine border well made, but drenched with liquid manure in summer, nearly as often as the sun dries the surface, and protected from frost in winter by a goodly supply of litter, with the addition of some fermenting material when forcing commences, may in all probability be damaged by an excess of intended kindness, and shanking may be the result.

Grapes may be spoiled by an excessive use of the engine; as for instance when they are dashed violently with water, which may at the same time be of a colder temperature than that of the house. If it be made a practice to shut up rather early, an unnecessary rise of the thermometer is the consequence. Dashing with cold water, steaming, and drying in a short space of time, is unnatural treatment, and is likely to be attended with injurious effects.

In two vineries under my care, there are Vines trained up the middle of the house and along the rafters to the top, for the purpose of making the most of the space, until the permanent Vines which had been cut down attain the necessary length of rod. There are now only from three to six spurs on them; there is no over-cropping, and no lack of a good bottom, nor want of a suitable soil, nor is there too much wet or cold, for the Vines are planted inside, and therefore sheltered from the elements, and yet the fruit invariably shanks. Unfortunately, we have our water to carry a considerable distance, and they are often too dry at the root. Their treatment in other respects is exactly the same as that of the permanent Vines, which produce excellent fruit.

Houses glazed with large panes, and the overlaps puttied, are injurious both to plants and fruit, if provision be not made to thoroughly ventilate them during night. Without a proper supply of fresh air, the Vines become unhealthy, and the bunches drawn and weakly. Vineries glazed with small squares, having spaces about 1-16th of an inch between the laps, are much more in accordance with sanatory rules than many of our new buildings. Those who will take the trouble to calculate the amount of ventilation they have in all sorts of weather, will perceive how this regular admission of air contributes to health, and consequently proves an antidote to shanking.

The temperature of a house, close as a Wardian case, and that of a house glazed with small squares and open laps, or otherwise properly ventilated, might be kept at the same pitch during the forcing season, but they would have to be maintained by a different amount of fuel, and would certainly be attended by different results. In the former case, the leaves would probably be blotched, and the bunches attenuated; while in the latter, they ought to be vigorous, close, and stubby. A certain though not invariable amount of humidity is necessary. Suddenly to withdraw moisture as soon as the first brown speck appears on perhaps a solitary berry, is bad practice; the leaves are injured, and the swelling of the fruit is checked by the sudden transition into a high temperature and arid atmosphere, and shanking and shrivelling may be the results.

The comparative exemption from shanking in early forced houses, as contrasted with those which are started later, and enjoy the advantage of finer weather, is worthy of notice. This may be safely ascribed to the greater attention which the former receive. In the latter, currents of cold air are seldom so sedulously guarded against.

It is important to make sure that the Vines are really growing in the temperature which the thermometer indicates, and therefore that instrument should be placed so as to give as nearly as possible the mean temperature of the house. The pressure of the atmosphere in cold windy weather, reduces the heat considerably in the front part, as may be readily seen by experiments with the thermometer, or by

the movements of steam from the flues or pipes, and the ascent of smoke in fumigation. Steam and hot air take an inward and upward direction. We may suppose the stratum of cold air in the front of the house to be bounded by something like a cycloidal curve, starting from the bottom of the front lights and terminating about the middle of the roof. A thermometer suspended between that line and the glass, close to the rafter, will indicate about 5° less than one in the warmer air below the line. In taking the temperature of the house, this circumstance should be carefully attended to. As a general rule, the thermometer should be suspended right over the heating apparatus. The effect of misplacing the thermometer in a vinery came particularly under my notice some years ago. It was suspended from a stake in the centre of the house. The Grapes shanked much every year, though the border had been well made a few years before, and there were other natural advantages. The thermometer was shifted near the front, and the shanking all but disappeared. Want of heat was the cause in this case, for it required more fuel to maintain the thermometer at the same degree in its new position than in the former one.

With Grape growing, as well as with plant growing, the errors of many are as much those of commission, as of omission. Our best safeguard is to endeavour to comprehend the whole subject, to trace effects to their proper causes, and, instead of looking for supposed remedies, to aim at preventing the possibility of failure.

CUMBRIA.

[We have given the above paper, slightly abridged, as containing important hints to Grape growers, and particularly to beginners. It does not appear, however, that the author has quite solved the problem which he has proposed to himself. He has stated some of the occasions of shanking, and for practical purposes that may be sufficient to suggest the means of guarding against it, but he cannot be said to have detected its cause, or to have explained the physiological principle on which it depends. As the solution of this mystery is of considerable interest, we take the liberty of suggesting the following points of enquiry to those who have opportunities of studying the subject.

1. Has shanking anything to do with imperfect fertilization of the Vine blossom? We expect an answer in the negative, because berries of the size of a small pea, and without seeds, and therefore imperfectly fecundated, are not unfrequently seen, even on ripe bunches. Still inadequate fecundation in other respects is possible.

2. In Pears and Apples numerous rudimentary fruits, apparently set, fall off; and in stone fruit many drop before stoning. This is generally understood to be Nature relieving herself of what she cannot mature. Has shanking any analogy to this natural process?

3. Does the evil in shanking commence in the footstalk as the name seems to indicate; or does it first appear in the berry?

4. Are there any traces of a sudden check in the growth from causes affecting either the leaves, the branches, or the roots?

5. Are there any appearances of minute fungi on the footstalks or on any other part of the plant?

6. Has the flour of sulphur been applied to the bunches in the hope of arresting the progress of shanking? It is known that sulphur is an effectual remedy for the Vine disease on the continent.

Perhaps various other points of inquiry will occur to other thinkers on the subject. The question is one admitting of an application of that method of the inductive logic by which one supposed cause after another is eliminated till the true one alone remains. The reader will observe that correspondent Cumbria assigns too many causes to have got at the true one. We have, therefore, called his causes *occasions*, that is conditions of that physiological state of the Vine, which is the real intimate cause of shanking, and which remains to be discovered. In our separation from Vineries we cannot undertake the inquiry ourselves. Might we not recommend it to "Cumbria," or to our excellent correspondent "Dhaidhaidh," if he has disentangled himself from those brakes of puzzlement in which he appeared to be lost in one of our recent numbers. —Ed. *Scot. Gard.*]

CULTURE OF THE MUSSÆNDA FRONDOSA.

THIS plant only requires to be better known to be more generally cultivated. With me it is quite a favourite, and not one who sees it fails to admire it; its foliage is of the most lively green, not over large, but of ample size; the flowers are at the points of the growing shoots, in tufts or bunches, similar to those of an *Ixora*, only the trusses are not near so large as those on that plant; each individual flower is about an inch long, and of a bright yellow colour. But the great beauty of this plant is in the pair of bracts which are produced beneath each truss of flowers, just in the same way as the old well-known *Poinsettia pulcherrima*, with this difference, those of the *Poinsettia* are of the richest scarlet tint imaginable, while those of the *Mussænda* are as white as snow. Let those who never saw this gem in its beauty, imagine a small Portugal Laurel, with the two uppermost leaves on each shoot of snowy whiteness, and between them a bunch of yellow flowers, and then they may form some idea of what the *Mussænda frondosa* is like. Some ladies were passing through my stoves one day when the *Mussænda* was in full beauty, green, white, and yellow; one of them suddenly exclaimed, "Oh, see two leaves on one stick!" meaning the green and white on one plant.

In offering a few observations on the mode of growing this plant, I will first speak of

Soil.—The roots of the *Mussaenda* are very fine, and branch and spread in every direction where the soil is favourable for it ; therefore, the compost must be light and open ; if heavy, the roots will not work in it as they ought to do, and without good root action, it is vain to look for a healthy development of shoots or foliage. It seems to be fond of sandy peat, but does not grow strong enough in that alone ; I add about one-third of very fibry loam, and if the peat is not of a light open texture, I put one-half of loam, but am careful to select such as is very full of fibre ; add to this one-sixth of rotten cow dung, and sufficient sand to keep the whole open, and it will be found to grow this plant to perfection.

Temperature.—This plant is a native of the East Indies, and consequently requires stove treatment. The temperature that is usually kept in this compartment will be found to suit this plant perfectly. It should never be in a lower temperature than 50° to 55° in winter when at rest, nor should it be much higher, or it will be kept in a state of excitement during that period which would be disadvantageous to the future success of the plant. As spring advances, rise to 60° and on to 65° and 70° ; during the summer months, 80° to 85° , always allowing it to go 5° higher in bright sunshine, with plenty of air ; as the days shorten in autumn, gradually decrease the heat until it comes to the previously given standard in winter.

Atmosphere.—This should be managed according to the season of the year ; in the winter, when the plants are at rest, it should be kept somewhat dry, though not excessively so, for it has a tendency to weaken rather than otherwise ; when the plants begin to “move” at the latter end of February, the moisture of the air should be increased, in order to encourage their growth, but avoid saturation, which at this early stage would do more harm than good. During the summer months, the great difficulty is to secure sufficient moisture in the atmosphere, what with the heat of the sun, and as a consequence, abundant ventilation, it is next to impossible to keep that degree of moistness in the house which we would desire. The floors should be frequently deluged with water ; slight shades should be used during the hottest part of the day ; “Shaw’s Tiffany” seems a likely material for this purpose. The house should be closed about four o’clock in the afternoon, and with a syringe moisten the plants, walls, and every available part of the interior of the house, which will produce a most genial state of the atmosphere, and the plants will assume that stiff sturdy appearance which is the delight of the cultivator. Open the ventilators a little at bed-time, so as to keep the air of the house sweet and pure.

Training.—As the plant grows, it will require training into its proper shape, whatever that shape may be ; it shows itself to great advantage when grown as a low spreading bush, and if this shape is fixed upon, all that is required is to keep the outside shoots down to the edge of the pot, and with a few sticks so arrange the centre

growths as to make the plant full and compact. I have them also growing in a pyramid form, but I think the bush shape shows them to the greatest advantage. They should be re-potted as they fill their pots with roots in spring, when growth is fairly started, and again about June, by which time they will be quite ready if all has gone on well. They will require frequent stopping; they will show flower when they have grown four or five inches, then is the time to stop them, pinch the flower buds out of every shoot, and they will break and grow about the same length, and then show bloom again; pinch a second time and a third; indeed, do so every time they show flower, as they are not intended to bloom the first year. If the stopping, potting, and training are attended to properly, they will by the end of the first year be very nice plants, and may be allowed to flower the following spring, which they will do in the month of May. When the blooming period is over, they must be encouraged to make growth again, which should be well matured before the winter sets in. Keep them moderately dry through the winter to secure a state of rest. About the middle of February, prune them by shortening all the young wood. In doing so, aim at the formation of a handsome plant, leaving the shoots longer or shorter as the different parts of the plant may require to make it even and balanced. Some shoots may be cut back to the pair of leaves, while others may require to be left two-thirds of their length. This must be left to the judgment and taste of the cultivator. When the buds start after pruning, they must be potted and treated in all respects the same as the previous season. When in active growth, a little weak manure water is beneficial to them, and if they can be plunged in a moderate bottom heat, they will reap the benefit of it, and its effects will be visible in the increased vigour of the whole plant.

T. J., Manchester.

THE CAMELLIA.

BY MR J. ANDERSON, GARDENER, MEADOW BANK, UDDINGSTONE.

(Continued from page 178.)

ONE is almost afraid, in these days of horticultural controversy, to single out any particular varieties for special merit, lest they should bring down upon themselves such a thunder-bolt of adverse opinion, as even the most far-seeing amongst us could scarcely foretell the end of. But as I have got no other object at heart, than candidly and to the best of my knowledge to pourtray their respective characters and relative value, I may be permitted in the sequel to simplify a host of new and old varieties into a few which I can confidently recommend to be among the very best in cultivation. There may, no doubt, be some varieties not specified in my subsequent list which

will bear comparison with many of my selected ones. If so, it is either because I have not seen them, or because unqualified afterwards to pronounce upon their merit; for, be it observed that I give no character to any single variety which I have not bloomed myself or seen bloomed in the possession of others.

At the same time, I take this opportunity of animadverting on the almost indescribable confusion which nurserymen in some cases send out Camellias, resulting from erroneous nomenclature. The fact is, unless you see them in flower, you are not sure but what that fine *Mathothiana* you have recently purchased may turn out to be *Presses' Eclipse*, or that *Teutonia* the coarse-flowered *Francofortensis*. Such has been the case with ourselves, and such will undoubtedly be the case with many more. Whether such gross carelessness can be the fault of nurserymen themselves, or the officials they employ, it is not for me to say; but the sooner such mal-practices are done away with, the better will it be for both buyer and seller.

I now proceed to give the names of the twelve best and most distinct varieties—at the same time, keeping in view those most useful for a succession of bloom during the winter and spring months.

Alba Plena, or old white.—Largest of all the whites, and as a white stands yet unsurpassed.

Imbricata rubra.—Fine red, blotched with white; a perfect gem when about half expanded.

Mathothiana.—Dark crimson, large, and finely built, free habit; altogether very brilliant when full expanded.

Teutonia.—A very pleasing and delicate variety, white, with rose stripe down centre of petal, and at other times rich rose, with white stripe; imbricated to the centre; fine.

Bothwelliana.—Rich carmine; extra large flower, with a greater number of petals than any flower I have yet seen; imbricated to the centre; reflexed, and altogether a decided acquisition. This superb variety was raised by Mr Turnbull, of Bothwell Castle, and will speak for itself when generally known.

Lady Hume's.—Blush; a fine ridge and furrow variety of medium size, but strong substance; blush white.

Saccio Nova.—Rosy pink, constant, good habit, very well up in the centre; invariably fine.

Fimbriata alba.—A fine fringed white, medium size, good habit, free bloomer, and early.

Aulica.—Blush ground, densely flaked and striped with carmine and flesh, extra fine, best of its class.

Lady Belhaven.—Rosy carmine, petals of great substance, large, and sometimes comes extra fine. This variety was first brought into notice by Mr W. Thomson, of Wishaw House Gardens, and was named in honour of Lady Belhaven.

Duchesse d'Orleans.—White ground, with carmine stripes, distinct and fine, lasts long in bloom.

Bealii Rosea.—Fine crimson, large, and free bloomer, best late variety extant.

I now give the best six semi-double varieties, for either ornamental purposes, or for cut blooms for stands, &c., &c.

Tricolor.—White striped and blotched with carmine; very ornamental. Generally the greater part of the flowers are in bloom at the same time.

Chandleri.—Fine deep crimson, mottled with white; very showy.

Chandleri Elegans.—A very large flower. Glistening pink, with centre petals white tipped; strong habit.

Donckelaeri.—A very handsome species; carmine, with white stripes and blotches; showy.

Marguerette Guillon.—A superb variety; white ground, with pink and carmine stripes. This sometimes comes exceedingly fine, with very dense markings.

Conchiflora.—A rosy red; medium size; very free bloomer, and consequently a very useful variety where cut blooms are in request.

I shall now give a selection of a few pink, rose, carmine, and crimson selfs that may be relied upon as being very good:—

Wilderi	Reine des Fleurs
Miniata	Regia
Duchess of Buccleuch	Adrien le brun
Countess of Eglinton	Clowesiana
Henri Favre	Halleyi
Landrethii	Marchioness of Exeter
Lowii	Myrtifolia
Palmer's Perfection	Hendersonii

And I may add Storyi, which is said to be an improved Imbricata, but I have never seen it.

Also a few white and striped varieties:—

Alba Imbricata (Low's)	Caryophyllioides
Montironii	Archduchess Augusta (very good)
Candidissima	Prince Albert
Carswelliana	Princess Bacchiochi
Comte de Paris	Colvilli Striata
Countess of Ellesmere	Double Stripe

Also the Archduchess Maria, which gets a very high character as a Continental variety.

HOT-WATER CIRCULATION.

BY MR SHEARER, YESTER GARDENS, GIFFORD.

In the laying of hot water pipes each place will require its own particular arrangement. In all, however, the boiler should be a considerable deal lower than the flow pipe. No doubt it will circulate

even although on a level, but the motion will be very sluggish, and the boiler, if at all powerful, will be apt to boil over, and stop the circulation. Much has been written on the cause of the circulation of hot water, and at the first application of it many erroneous notions were held; and from what I see, I am afraid it is still little understood, or there would not be so much dissatisfaction in the working of these apparatus. There can be no doubt but it is owing to the difference in specific gravity of the water in the pipes and boiler; each particle of water as it is heated in the boiler, rises to the highest point, wherever that is, because it is lighter, and the cold particles being heavier, fall to the bottom to be heated, and rise to the surface; and so on, until all the water become of the same temperature. When each particle of water is heated it expands; it becomes of greater bulk, and as it rises it is impeded in its motion by the cold particles of water, and so retards its motion to a certain extent.

This friction of the hot and cold particles of water, and the friction of the water as it passes along the pipe, is all that we have to contend against; but it is enough when the pipes have to be carried any distance from the boiler, if the pipes are laid on a dead level, and the boiler not sunk below the level of the return pipe. I would therefore strongly urge the propriety of keeping the boiler low. In some situations from the want of drainage this cannot be easily got; but every plan should be tried to accomplish it, and no boiler will work well that has less than a foot of fall, but if it has six feet, so much the better; it will give a more rapid circulation, and will require less coal to heat the same amount of pipe, as the heat is rapidly absorbed and carried away from the boiler by the water. When we consider that a gallon of water at a temperature of 62° , weighs exactly 10 lbs.; when at a temperature of 80° , a gallon weighs 9 lbs. and 978 thousand parts of a lb.; from this slight difference in the weight of water at these temperatures will be seen the necessity of assisting the circulation by all the means we have at command. I am aware that a greater pressure will be exerted on the boiler, by the height of the column of water, but it is not worth taking into consideration. All boilers should be strong enough to stand far more than is ever required in Horticultural erections. I have been trying some experiments with a glass apparatus which I got made, in order to get a better notion of the circulation. It consists of a tin boiler, having one flow at the top and two returns, one on each side at the bottom. The pipes are glass tubes, one quarter of an inch diameter, bent two or three times, and led back to the return. The pipes have a supply cistern at the highest part. When the pipes were filled and heat applied by a spirit lamp to the boiler, the distance from the return pipe or bottom of the boiler to the flow pipe being three inches, I completely failed in making the water to circulate; it boiled out at the supply pipe. I then raised the flow pipe one foot above the return pipe, when the circu-

lation began immediately. I applied the heat, and it had no tendency to boil over, although I heated longer than in the previous case. I observed, too, that the water in the upper part of the pipes circulated much more rapidly than that in the under part; this I was not prepared for, but it was evident from the motion of the particles of matter I had put into the water, viz., scrapings of bones, and still more the small particles of rust that had been engendered by the action of the water on the tin boiler, from the different times I had used it. This, then, is another cause of impediment to the circulation which must be taken into account, no doubt, but the smaller the pipe the less rapid will be the circulation; and had the glass tubes been longer, the water would have circulated in the first detailed experiment; but owing to the friction on the tubes, and the friction among the hot and cold particles of water, the difference of specific gravity of the two could not overcome the obstacle, but was assisted by raising the flow pipe. As it is well known that water runs faster down a hill than on a level, so that all pipes should have a rise from the boiler of at least 1 inch in 18 feet, and the return pipe even more; and when near the boiler, dropping into it at right angles, 3, 4, or 6 feet if possible.

It sometimes occurs that a boiler requires to be placed at the end of the houses to be heated; in these cases, there is the flow pipe on the top and the return united at *one* side of the boiler; now both sides of the boiler should be united by returns, or there will be a defect in the efficiency of the apparatus. The reason of this, I confess, I am not able fully to explain, unless by the friction of the particles of water in the boiler, which I have already explained. I intended ere this to have satisfied myself with ocular demonstrations of how the action went on, but the great difficulty is in getting a glass boiler having the holes in the sides to stand the heat. I have not given up the attempt yet, and if I succeed, will communicate the result in a future paper.

I have it from one of the greatest and most successful heaters of horticultural buildings of the present day, that his services were called into requisition by a gentleman who had a boiler placed as I have described. It all seemed to have been put up in the best manner, plenty of pipe, and the boiler large enough. He could detect no fault until the boiler was exposed, when he found it not connected at both sides. The boiler was taken out, pieced and connected again, after which it gave entire satisfaction. In all subsequent arrangements he has adopted the same plan. Previous to this circumstance, he was not aware that it was detrimental to the efficiency of the apparatus. It was the only reason he could assign, although he had his doubts, but the result was success; being a practical one, it deserves to be recorded for the benefit of others; being in the same position here in the placing of one of our boilers, led me to get acquainted with the circumstance.

In making the joints of the pipes, some take red lead and rope

yarn as being easier taken to pieces if required, and Mr Thomson is now using cement with success. In using either, the pipes all require to be put in their places, and not moved till all set; when old rope yarn and rust is used, they can be moved about as required, that is, two or three joints together; the cement, however, has the advantage of being easily put into the joints in places where the hammer cannot be applied easily. The rust composition is made by adding a little sal-ammoniac to iron borings, and wetting and mixing well the whole together; there should not be much used in each; the joint should be finished up with it for the sake of neatness.

Stopcocks in all cases should be avoided, as when not in use, they are apt, and, indeed, do get set, so that it is difficult to move them; and when often used, they soon become leaky, and rendered of no use. We have still a good and cheap system of taking and letting on the water to find out, and I have no doubt it can be done; perhaps, the most efficient valve is that which is fitted into a brass socket, and fixed into the flow pipe; proceeding from a cistern where all the departments may proceed from, it is kept in its place by a screw on the spindle of the valve.

There is another used much about London; it is fixed into a double faucet, the valve being brass; when shut, it stands across the pipe; when open, parallel with the pipe; having a brass handle for turning it, passing through a stuffing box. It is a very simple one, and cannot go out of order, but unfortunately it cannot be made perfectly tight, and, therefore, it is not a perfect stop; still, it may be applied in a number of cases with advantage.

Where more than one house is heated by the same boiler, there should be a separate flow pipe to each, as the house farthest from the boiler could be heated, while the others were not; or if valves were fixed at the connection of each house would do as well, only the valves add much to the expense, while wooden plugs would do in the other; the returns being covered up, they do not require a separate pipe. The return pipes may be 3 inch ones, as the water has contracted a good deal in the cooling, and it has no opposing currents when near the boiler.

The pipes should always be kept black; this can be done with lamp black and linseed oil; it assists the radiation very much, and they look better. I am no advocate for pipes cast with troughs for holding water on the outside; they are expensive in the first place, and owing to their liability to rust they soon waste away. I use zinc troughs which can be taken off and put on when required, which I think answers all that is required in that way.

As to the expense of heating a house, that depends much on the circumstances of the place, and the position of the boiler; the fewer bends the better. I agree with Mr Thomson in his remarks in last month's *Florist*, that the quantity of pipes can be put into the house he describes for the money, but he allows nothing for tradesmen,

who make a living by it; and in his case the gardener must be the designer, and assist in executing the work. Unfortunately few gardeners have the experience to do so, and they do not attempt it. Gentlemen, again, will not entrust them with it, but would rather pay for a plan from some one who has the courage to say he is capable; and the job is generally bungled, and then the hot water system is condemned as being expensive and insufficient. I have had no experience in the erection of flues, but I cannot see how they can be put up cheaper than hot water, when one boiler heats several houses; besides the arches to support the flues on the soles, and covers, cost one shilling per foot, there are the bricks, &c., for sides, and a furnace for each house, while one furnace does for the hot water.

If some one who had built a flue would give the true cost, it would be easily known what would be the difference. Any one could ascertain for themselves by applying to J. & J. Robertson, of Berwick. For the price of their pipes and castings, they have just issued lithographic drawings, of nearly all that is required in heating, and all numbered, so that any one might order what they please, by the number. I can recommend that firm as being very attentive and very expeditious in executing orders; I do so the more freely, as I am disinterested, never having seen one of the firm, and we have got here upwards of a quarter-of-a-mile of pipe, and other things from them. Their pipes too, are the same as those used about London, and not the clumsy gas pipes that one sees put up in the neighbourhood of Edinburgh.

THE PLANT STOVE,

WITH A FEW BRIEF REMARKS ON THE MANAGEMENT OF
STOVE PLANTS.

(Continued from page 383, Vol. V.)

Gesnera.—A genus of very showy perennials, with beautiful velvet-like leaves, particularly *Splendens*, with the exception of one or two new varieties, such as *Donckelaeri* and *Magnifica*. *Zebrina* and *Splendens* are among the best; the flowers of *Zebrina* are larger and more showy than those of *Splendens*; they are of a bright red on the upper part, the under side yellow, and on the inner part of the tube are crimson spots on a yellow ground, not unlike that of *Achimenes gigantea*.

The flowers are produced along the sides of a branching stem, rising at the top of the plant. The blooming period is from August to October.

To propagate this sort, take the bulb and place it within an eight inch pot, any time in March, in a compost of turfy loam and peat, with a little rotten dung added: they are then to be placed in the

stove, as near to the glass as possible, to prevent the young shoots, as they are produced, from being drawn too much; they are naturally inclined to draw if not so placed.

As they begin to grow, they must be watered now and again so as to keep them moist; when the pots begin to get full of fibres and growing round the pot, it is necessary that the pot should be changed for one a size larger—a ten-inch pot will not be too large. When they have done flowering, no more water is given them; they are allowed to die down, when they are stowed away on a back shelf of the stove, or any other dry place where no frost can have access to their roots.

Gloxinia.—This is another genus with fine velvet-like leaves, not rising above nine inches high. Considering the many fine varieties, it is a pity that they are not more extensively spread amongst collections than what is to be met with, especially in this quarter. They are truly beautiful little things when well cultivated; they are easily managed, and give a pleasant effect throughout the summer when placed in the greenhouse, where they will continue blooming for several months.

The *Gloxinia* is in the fourteenth class, and second order of the Linnæan system of Botany. The calyx is five-cleft, and the corolla is bell-shaped, nearly resembling that of the Foxglove, wide at the top, showing the throat entire; it has been in cultivation since 1815, and is a native of South America.

The *Gloxinia* having bulbous roots not unlike those of *Gesnera*, when we receive them from the seed shops, they are potted in 6-inch pots, in soil composed of peat, silver sand, leaf mould, and a little loam. For those who have not the convenience of a stove, early in March they are started into growth by placing the pots within a Melon frame; in this they are found to have both heat and moisture suitable to their growth. As soon as they have commenced to grow, they may be removed to the greenhouse. Our practice has been to allow them the heat of the stove until they come into bloom; this takes place the latter end of May, just at the time when the inmates of the greenhouse are being placed in their summer quarters.

There being fewer plants now in the greenhouse, the lights are kept much closer. This is found to be more suitable to the growth of the *Gloxinia*. If proper care and attention are given them, they will continue to bloom for three or four months, or even more. Although this class delights in a moist atmosphere, it is nevertheless impatient of water at the roots; we never give any unless the soil appear to be dry, as it spoils the beauty of their leaves, and shortens the period of their bloom.

At the end of the season water is withheld, and the leaves allowed to die down of their own accord. In winter they are placed in a dry corner of the stove, or any other suitable place free from damp, and where frost has no access to them. On the return of March

they are again set in action by shaking the mould from them, and re-potted, going through the same routine as formerly. The following are a few of the varieties grown here. *Hamiltonii*, white, with a crimson throat; *Imperialis*, light, with a blue and deep purple throat; *Grand Sultan*, pink flower, and a white throat; *Marie Van Houtte*, light flower, with a deep carmine throat; *Leucaneria*, this is a beautiful dwarf variety, with large variegated leaves, producing a large mass of blue flowers, with a white throat; *Sir Charles Napier*, rosy red, with a deeper red in the throat; *Wilsonii*, this is a beautiful variety, producing large flowers, which are light, with a carmine throat, and the inside white; *Teuchlerria*, pink flower, with a deep red throat; *Prince of Wales*, light flower, with a blue throat; *Fifiana*, the outside of the flowers are light, and of a dark blue inside; *Hybridum*, lilac flowers, with a white throat, producing large leaves, which are of a deep green; *Cartonia*, the outside of the flowers are of a rosy red, light in the throat.

Gardenia.—Although this family are denominated stove plants, we really do not like to see them grown in such a situation, as they are generally poor, ill-grown, starved-looking things, and as often overrun with red spider as otherwise. When well grown, there is hardly a plant to be met with equal to this (the Cape Jessamine) for its pleasant fragrance, its dark-green leaves, and pure white blossoms, which grow properly at the point of the young shoots which are to be found in spring. It is propagated by cuttings, and that by taking the young shoots which have no bloom upon them, and this at the time the others are in bloom, as at this time they are the more easily known. The cutting pots ought to be clean, and of any convenient size, half-full of crocks, with a thin layer of moss (*hypnum*) over them, the better to prevent the soil searching through the drainage; the remaining half should be filled with peat and rotten dung, but the top inch with silver sand. Before putting in the cuttings, I give the pot a gentle watering with a fine-rosed watering pot. The cuttings taken off are about two inches long; their lower leaves removed, and the bottom of each cutting prepared with a sharp knife. They are then dibbled into the pot, giving them a slight watering overhead, so as to firm the sand close to the cuttings. They are then placed within a frame, on a mild bottom heat, with an atmospheric temperature of 70°; they are all the better to be covered with a bell-glass, which should be wiped regularly every morning with a dry cloth. As soon as they have formed their roots, they are transferred to 3½ inch pots, and they are then put back into the frame. Should they begin to decline, fresh linings of stable litter are applied; this assists both in keeping up the heat and the necessary degree of moisture, which are found congenial to their welfare.

As the season advances, tilt up the glass considerably, so as to give abundance of air, which is requisite for their health, and to prevent their fine glossy foliage from being injured from the burning

rays of a summer sun; to prevent this, a mat should be placed over them. As the plants progress, they should be gradually removed to a pit a size larger; as the blooms are being produced, they are all the better of being removed to the greenhouse—in it they will emit their pleasant odour.

Hoya campanulata.—This and the following variety are of more recent date than the *Hoya carnosa*. This variety is a native of Java, growing in mountainous districts, and, like *carnosa*, is a climbing plant, producing large drooping umbels, which are fleshy, buff-coloured, and slightly bell-shaped. It is an interesting species, and is truly beautiful when grown amongst the other varieties.

Hoya bella.—This beautiful little species has small green leaves, and is of a slender habit. The umbels produced are of a pure white, with a purple centre, in July and August, and is grown by some gardeners in baskets, and managed in the same way as some of the Orchids, suspended from the rafters of the stove. It is grown in 7-inch pots. While the plants are in a young state, they are topped, to cause them to throw out laterals. When those have broken sufficiently, they are tied to neat little stakes, and placed in that part of the stove where they will have plenty of light. This species ought to be in every collection.

J. F.

THE DENDROBIUM DALHOUSIANUM.

THERE are few plants more ornamental, few indeed more strikingly handsome than well-flowered specimens of the *Dendrobium* genus of Orchidaceæ. Our old friend *D. nobile*, and more especially *D. nobile major*, will ever be looked on with intense admiration. But although we are not wanting in respect to older sorts, we are always disposed to look with a favourable eye to any newer importation. We rather err on this side; because, from the idea of the plant being of fresh introduction, the anxiety to see it bloom, the difficulties we may probably have to meet with before we possess it, all these have a certain influence upon our judgment, when the bud has expanded itself into full flower.

The *D. Dalhousianum* is not of a very recent introduction, for it was figured in *Paxton's Magazine of Botany*, so far back as the year 1844. It was presented to the Calcutta Botanic Gardens by Lady Dalhousie, and from thence imported to Chatsworth, and to the Messrs Loddiges of Hackney, from whose establishment it was figured; and, for aught I know flowered first there in Britain. It is a tall-growing variety, flowers towards the top of the two-year-old leafless stem, and seems to grow well in a mixture of peat and sphagnum. The flowers when full expanded will measure 4 inches across, with a boat-shaped labellum of extra fine proportions. The upper half has a very deep crimson maroon blotch on each side,

separated by four to five crimson lines in the centre. The lower part of the labellum is creamy white, densely covered with long woolly hairs. The sepals and petals are blush pink, giving the entire flower a richness of contrast, a solidity of substance, and a delicacy of texture, which will at all events equal, if not surpass many of this lovely family.

Many of the species flower best to be kept in the Mexican house during the winter months. This variety will flower better if kept in the East Indian house, and also withholding water from it for at least three months during its season of rest. The difference of temperature between our East Indian and Mexican houses during their season of rest are—the former is kept as near as possible at 60° for a night temperature, and 65° or 70° if sunny weather for a day temperature; the latter is kept at 53° or a minimum of 50° during night, and 60° or a maximum of 65° during the day. This fine species is now in full flower with us, and will continue in bloom from its first opening, from three to four weeks. I do not know whether it has ever flowered in Scotland before. Probably some of your readers may know.

JAMES ANDERSON.

Meadow Bank, 20th April.

BARBARROSA GRAPE.

SOME three or four years ago I visited an extensive garden in Bedfordshire in November, where I saw this Grape cropped heavily in the same house with Black Hamburgs. Both sorts were a good crop, and equally black in colour. The other day I met with the gardener who then had and still has the management of the same Vines, and he informed me that the Barbarossa always shows plenty of fruit with him, but sometimes it is shy in setting on its own roots; but grafted on the Black Damascus Vine it sets without any trouble. The gardener in question considers it useful on account of its hanging longer than any other black Grape, when it makes at least a variety for the table. If others of your readers would communicate what they know *pro* and *con* of this Vine, it may be useful to many who are about planting, and would help to show what is the *general* character of it as a cropper, &c.

I do not at all "object" to Mr Cramb's statements concerning this Grape. In common with others I have reason to thank him for them. I quite sympathise with him in the reasons for which he took up the subject, and if the Barbarossa is what Mr Cramb states it to be, by all means let it be coupled with "this age of humbug." All I want is, a more constitutional jury and a justice different from that of a certain old proverb,

D. THOMSON, Dyrham Park.

ON THE APPLICATION OF BOTANY TO ORNAMENTAL ART.

At a meeting of the Edinburgh Botanical Society, held on the 9th ult., Mr George Lawson exhibited a panel carved by Mr B. Reeve, representing in its side ornaments *Polypodium alpestre* and *Poystichum Lonchitis*. In connection with this study from nature, he called attention to the inexhaustible source of novelty in design which the vegetable kingdom presents, and which he hoped would be made more fully available than hitherto, for although "flowers have in all ages been used by the aspiring ornamentist, and have ever been the basis on which the science of ornament has stood," much still remained to be done. The Papyrus and the Lotus, in their numerous combinations, were the chief subjects of Egyptian ornament; the Acanthus leaf formed a pattern for the capital of the Corinthian pillar; the *Fleur-de-lis* is also an ornament which has stood the test of time. Even in our own day novelties are occasionally introduced by enterprising designers; still, how easy would it be to catalogue all the vegetable forms that have actually been referred to in design. Of the ninety-three thousand living plants (not to speak of dead species), how few have actually come into general use for this purpose! Mr Lawson stated that in a late lecture to the Royal College of Surgeons, Professor Balfour pointed out the wonderful symmetry that prevails throughout the vegetable kingdom, both in the minute tissues, and in the compound organs of plants. Professor M'Cosh and Professor Dickie have illustrated the laws of form, and the relations of colour to form in plants; Dr Lindley and, more recently, Mr Dresser have done much to elucidate this very subject of the relations of botany to ornamental art, and with such aids, the wall of separation that has so long existed between the botanist and the ornamentist will surely be speedily broken down. Mr Lawson then referred to some of the authors who had been instrumental in drawing attention to this subject, alluding particularly to Pugin's "*Floriated Ornament*," and to various writers in the *Builder*, *Art Journal*, &c. He proceeded—It is to be kept in view, when the artist is recommended to study nature under the light of science, that this does not *necessitate* a naturalistic treatment of his subject. Attention to botany is even more essential to him who would create a design by the conventional treatment of natural forms, than it is to the naturalistic designer. It is what anatomy is to the painter of the human figure. It enables him to modify his leaves and flowers according to the requirements of his design, without overstepping the boundaries of truth, and originating a caricature, instead of adapting nature to his special purpose. It is a common error to suppose that the artist has merely to take natural forms as his starting point, and give these a geometrical disposition, modifying them according to his taste. Truth to nature is necessary in all decorations intended for an educated eye, and especially so in an age of science. And the beautiful laws of form, and of colour, of number, and of arrangement of parts, that prevail throughout the vegetable kingdom are necessary to be known by the artist, who has high aims. This knowledge loosens him from the trammels of a mere copyist, and gives him a wide range of conventional treatment, while his work assumes the character of an exposition of principles instead of a slavish copy of details.

It is a well-known fact that many of the finest carved works, in both ancient and modern buildings, are *direct* studies from nature, and several modern writers have lately pointed out to designers, that it is to "*natural forms geometrically disposed*" that they must *all* look for new inspirations. "By repeated copying (says Pugin), the spirit of the original work is liable to be lost; so in decoration, the constant reproduction of old patterns, without reference to the natural type from which they were composed, leads to debased forms and spiritless outline, and in the end to a mere caricature of a beautiful original. It is impossible to improve on the works of God; and the natural outlines of leaves and flowers must be more perfect and beautiful than any

invention of man." And the same writer observes—"Nature supplied the mediæval artists with all their forms and ideas; the same inexhaustible source is open to us, and if we go to the fountain-head, we shall produce a multitude of beautiful designs treated in the same spirit as the old, but new in form. We have the advantage of many important botanical discoveries which were unknown to our ancestors; and surely it is in accordance with the true principles of art, to avail ourselves of all that is beautiful for the composition of our designs."

Mr Lawson illustrated by means of drawings the beautiful designs that may be occasionally produced from the judicious treatment of even the simplest materials, such as the trifoliate leaf. This led to a discussion of the origin of the trefoil as an architectural ornament, which was stated to belong to a very early period, although its extensive use during the Christian era was probably connected with the myth of St Patrick and the Irish Shamrock. The differences of opinion that prevailed respecting the species of plants which form our national emblems, were alluded to in detail. Such matters, the author observed, "are of little importance in a botanical point of view; but it must be confessed, that when an artist asks such questions as—what plant is the Scotch Thistle? or what is the Irish Shamrock? and we cannot tell, it places botany in a humiliating light; and we are not to charge him with wanton neglect, if he does not refer to nature, in embodying these our national emblems."

WEARING OUT OF THE GOLDEN PIPPIN.

You say the subject of degeneracy of varieties in fruit trees has become threadbare. I presume, therefore, that as far as the *Gardeners' Chronicle* is concerned, the matter is to be speedily dropped. As the greater number of writers appear to differ from my experience of the matter, you will perhaps permit me very briefly to recapitulate the facts upon which I have grounded my opinion. And before doing so, I must say that very much of irrelevant matter has crept into, and indeed made up too much of the staple stuff of the argument. For instance, what has the Garlic of Askalon to do with the falling off of vigour in a cultivated race of Apple-trees! The one an herbaceous plant ages ago growing *wild* in a certain locality, and at the present time is to be found growing in the same place; the other a garden variety of a *tree* continued by grafting; there surely is nothing at all analagous—nothing but by which in admitting the one the other may be consistently denied. In the same way I will pass over all the remarks upon Potatoes, Dahlias, and the like, nor does the case of Oaks reared from acorns in plantations, of Elms from suckers, or Poplars and Willows from cuttings, tempt me to diverge from the question at issue. We come, therefore, back to the starting-point, namely, that certain cultivated varieties of fruit trees formerly grew vigorously, and made large orchard trees, that now refuse to do so—this is fairly met by the showing that other sorts, well known a century since, are still healthy and fruit bearing. Admitting this latter fact, for I have no wish to travel out of my record, what has that fact to do with the one I name, the condition of which is totally the reverse? In this place I will only speak of one variety, the old Golden Pippin. The answer is given, that in a warmer climate they still produce good fruit; and more recently, that some grafts taken from Kent have grown well, and fruited within the last 20 years. Admitting both of these cases as facts, are they answers to the following—Do they place the question as settled against the weakening and degeneracy of the variety! When a boy, some half a century since, there were many old Golden Pippins in this neighbourhood, whose stems at the base were 2 feet diameter. I was employed to mend up the old orchards

with the same kind, and did so with grafts, sometimes from the old trees, "to ensure the good old kind." There are no trees in any of the orchards now alive that were so planted—they invariably dwindled away—bearing a few Apples, but refusing to make vigorous wood, and consequently never forming trees of any stature, and indeed it was a rare thing to find one that acquired the thickness of a man's arm. Here the climate, soil, and locality were identical; but some will contend that the trees growing two centuries before had deprived the soil of the proper food, and consequently those I had planted were starved. This is answered by my having tried to rear the same kind in land contiguous, that as far as was known had never been applied to this purpose the result was precisely the same. This conclusively shows that in the same climate, locality, and soil where Golden Pippins formerly grew to a diameter of 2 feet, they now scarcely ever attain 6 inches before they die. Another case that I may call intermediate may be quoted:—Thirty years since there existed, and still exists, a goodly tree of this kind, its girth being 3 feet, or 1 foot diameter; now this one tree induced the then proprietor to plant the orchard with them; this I superintended—the result as before. They all died a lingering death, and not one young one is left to cheer the veteran who has outlived them, and does not appear to have gained an inch during the period. I will now recount what may be seen in our nursery—a fact of more recent date:—For the purpose of having grafts of any particular kind that could be depended upon, I planted out by the sides of a walk two rows containing upwards of 150 varieties; they were all planted in the same year, the girth of some of the varieties is 34 to 36 inches, 6 inches from the ground; that of the old Golden Pippin 13 inches at the present time. We have now ceased to graft the kind altogether; but before we did we placed it on the strongest stocks of the year; and it never passed the second year from the graft without showing signs of decay, although the limbs of other sorts in immediate contact grew as fine and as vigorously as could be wished. These are facts I will answer for, and they point to no other conclusion than the wearing out of that excellent variety. But Kentish orchards have been famed for ages, and their cultivators as perfect in their work as the people of Normandy, as I have witnessed; moreover, they have as keen a sense of their own interest as other people. Would they be content to receive a few shillings per bushel at Covent Garden for their produce if they could grow Golden Pippins and sell them at a guinea for the like quantity? In the fruit growing district the Golden Pippin has disappeared—"Stat nominis umbra"—and if the observations of a life may be deemed prophetic, it will never be renewed except by fresh seedlings.—WILLIAM MASTERS, F.H.S., Canterbury, in *Gardeners' Chronicle* of 4th April.

CULTIVATION OF FERNS IN OPEN BORDERS.

The attention of persons of taste has in recent years been particularly directed towards the cultivation of Ferns, both hardy and exotic; but whilst the system of culture in the case of the latter has been, and still continues to be, gradually improving, that of the former has not made any advance for the last ten years, but has, perhaps, rather retrograded. Many collections of hardy Ferns are grown in pots, but that plan is attended with so much trouble and expense, that it is not likely ever to become a method generally adopted. Many have also been planted in open borders, and in some instances they have fully answered the expectation of the cultivator; but in the majority they have failed to do so, owing to the circumstances under which they grow in their wild state not having been sufficiently attended to under cultivation.

Now the conditions under which most of our hardy Ferns grow naturally, and under which they flourish with the greatest luxuriance, are four; a por-

ous soil, a damp atmosphere, a subdued light, and a protection from sharp cutting winds; and if an approximation towards these natural conditions be observed under cultivation, I can say from long experience that success is certain. First, as to soil; the majority of our hardy Ferns are not so particular as to what kind of soil they grow in as they are generally supposed to be, and they will not refuse any through which the water percolates freely except chalk. As to a damp atmosphere, that they require most at the time when they are throwing up their fronds; and when, if there are neither genial showers nor strong dews, they can very easily be assisted with a sprinkle from the fine rose of a watering pot. As to light, we must plant them in a situation where they are protected from the direct rays of the sun between the hours of 9 in the morning and 3 in the afternoon in the month of June. In the matter of shelter from cutting winds, the cultivator must be entirely guided by circumstances, but if the place chosen is exposed to the east or to the west, a strong Evergreen or two will be generally found quite sufficient to break the force of any such wind as we may expect in the months of May and June, and it is at this season of the year, when the fronds are in a young and tender state, that they require the greatest protection. Two more things are necessary to be observed to insure a successful cultivation—to be careful that they are not planted close to trees or shrubs that produce a large quantity of fibrous roots near the surface of the soil, nor to choose a situation subject to the drip of large trees; in the one case the roots will rob the border of all the moisture and thereby starve the Ferns, and in the other the umbrageous foliage will prevent dews and gentle showers from reaching the borders, although it will cause heavy rains to descend in larger drops, and thereby batter the soil and plants beneath. Within the last ten or twelve years I have planted many borders of Ferns with good success, and have been consulted upon the planting of others, and I have come to the conclusion that every large or small garden that has a north aspect belonging to it may be enriched with a border of Ferns.

I wish it to be understood that what I have just stated is only applicable to such hardy Ferns as grow naturally upon the banks of shady lanes, in woods, or near to swamps; and that the smaller and more delicate kinds, which grow upon rocks, ruins, or old walls, will not succeed in any such situation, having never been successfully cultivated except in pots; and even there they require a great deal of troublesome attention, and are to be considered more as botanical rarities than as ornamental plants.—JOHN LLOYD, 11, Gloucester Street, Vauxhall, in *Gardeners' Chronicle*.

FLORAL NOVELTIES.—There is at present in the Stanwell Nurseries, Bonnington Road (Mr Methven), a handsome specimen of the new *Rhododendron Thomsoni* coming into bloom, being the first time it has flowered in this country. This is one of the new specimens of *Rhododendrons* introduced by the celebrated Dr Hooker, of the Royal Gardens, Kew, from the Sikkim Himalaya Mountains in India, and is in foliage and general appearance very distinct from any of the sorts formerly known, while the flower is of an extremely deep crimson colour; and as it is understood that it will stand hardy in this country, it will be a decided acquisition to this very ornamental family of flowering shrubs. There are also plants of the Sikkim "*Dalhousieanum*," and the exquisitely fragrant "*Edgeworthii*," just expanding into flower.

THE ROOT GARDEN, BIDDULPH GRANGE, STAFFORDSHIRE.

The root garden, or as it is called here, for want of a better name, "The Stumpery," consists of a very picturesque assemblage of old roots, or rugged stems and stumps of trees—chiefly the latter—piled to the height of 8 or 10 feet on either side of a winding and rapidly descending walk. They are so irregularly arranged as to jut forward in the boldest prominence, and even to

be united into a rustic arch in some places, while in others they recede far enough to allow room at their base for little gatherings of choice herbaceous plants, bulbs, or miniature shrubs. Mr Bateman (the proprietor) has been singularly fortunate in procuring a quantity of the most gnarled, contorted, and varied masses of wood imaginable for this purpose, and they are joined together and disposed with consummate art. The blocks being all of oak, too, are likely to be very durable. Over considerable portions of the whole, masses of Ivy, Virginian Creeper, Cotoneaster, and other trailing plants, scramble about in the wildest manner. And the interstices, as well as the open spaces, now and then occurring at the base, are all used for the reception of some characteristic or interesting plant or group. For example, near the entrance to this region, the Hellebores, which are among the earliest of the winter-flowering plants, are clustered in great variety. Then follow the Anemones, Epimediums, Scillas, Dog-tooth Violets, Lilies of the Valley, &c., each kind receiving the precise amount of sun-light or shade which is desirable for it, and all being intermingled with Gualtherias, Pernettyas, Cotoneasters, Savins, and such other dwarf evergreens as serve to produce a sufficiency of green clothing at all seasons of the year. Even the rarer hardy Orchises and Cypripediums have an appropriate corner assigned to them, and seem quite at home in it. Among the Hellebores, *H. lividus* is remarkable for its large thick evergreen foliage, which resembles that of a Mahonia, and possesses a very decided character. Of the Epimediums here growing beautifully, *E. rubrum* is the most showy. *Tiarella condifolia* is a pretty little trailing plant, with the appearance of a Saxifrage, which clothes large patches of roots. *Spiræa venusta*, with its stately habit, and fine rosy flowers, is a handsome herbaceous ornament to this part. *Actæa spicata* also forms a noble feature of the same class; and standard Cotoneasters, with fine drooping heads, have a happy effect at some salient points.—E. KEMP, *Gardener's Chronicle*.

HORTICULTURAL SOCIETY'S MEETING OF APRIL 7TH.

(From a Correspondent.)

ALTOGETHER this was a very successful and interesting meeting. The attendance of ladies and gentlemen, and the interest manifested were more than has been seen at these meetings for years. Twenty-four new fellows were elected, consisting of Earls, Honourables, nurserymen, and gardeners. With such monthly accessions to the list of fellows, there is every prospect that the funds of this Society will speedily be placed in a position to take its appropriate place among those Societies which contribute to the general good of mankind, and especially to the promotion of the science of cultivating flowers and plants, and the improvement of all that appertains to gardening. And with so spirited and practical a gentleman at the head of matters at the gardens themselves as Mr M'Ewen, there is little to fear but that the impetus will be given to the gardening world worthy of both the Society and the nation.

The quantity of flowers and fruits exhibited on this occasion was considerable, and amongst them many new and interesting things.

Pine Apples were contributed by Mr Clement, Oak Hill, Barnet, one of which was a Providence, weighing 4 lbs. 15 oz. Mr Bray, gardener to J. Lousada, Esq., had a smooth Cayenne, weighing 4 lbs. 4 oz. From Mr Gavin, Hopetoun House, came a prickly Cayenne which weighed 3 lbs.

From Mr Forbes of Woburn Abbey came a dish of Black Hamburgh Grapes. The bunches were average in size, and very compact, and exceedingly well coloured and bloomed. Mrs Alderson, of Lambeth, sent a dish of Sweetwater, which were not quite ripe, and a little affected with rust.

Strawberries were contributed by Mr Ingram, gardener to J. J. Blandy, Esq., High Grove, Reading; Mr Tillyard, of Heckfield, and Mr Clark of Chobham Park; but all of these were of second rate quality, considering the advanced state of the spring. Mr Ingram's dish was the best. Those from the other two were rather stale and damaged.

Mr Tillyard exhibited a quantity of beautifully preserved *Beurré Rance* Pears. These were as well preserved and fresh as could possibly be desired.

Mr Cockburn, gardener to Lord Mansfield, of Kenwood, sent some preserved Cranberries both dry and bottled. The former had been kept on a dry shelf in the fruit room; the latter bottled in water, and had been so preserved since 1855. Mr Cockburn recommends the cultivation of these as a delicious fruit and easily managed.

Among orchids there were many interesting specimens, most particularly a large and most robust and beautifully flowered plant of *Dendrobium densiflorum* from Mr Lawrence, gardener to the Bishop of Winchester. This plant certainly the gem of the meeting, was much admired by all who saw it. Messrs Veitch, of Chelsea, furnished a numerous and interesting collection, comprising a well flowered plant of *Dendrobium Cambridgeanum*, *odontoglossum pescatorei*, *Vanda suavis*, a strong and nicely flowered plant of *Cypripedium villosum*. These and all the other things were fresh and beautifully grown. Mr Jackson of Kingston also furnished a small collection, in which there was nothing worthy of particular notice. Mr Parker, Paradise Nursery, Hornsey, sent a new and most interesting species of *Cypripedium*, beautifully marked, and furnished with long and peculiar looking hair, giving it a distinct and curious appearance. This species will form a most interesting addition to the already much admired *Lady's Slipper*. From Mr R. Warner came the rare *Dendrobium luteiflorum*, and *Oncidium bifolium*.

We expected to have seen a better show of *Azaleas* than was contributed on this occasion. The contributors were Messrs Veitch, Mr Cutbush of Barnet, and S. Allnut, Esq. The most interesting plant among them was a moderate sized, but well-flowered specimen of that most beautiful variety called *Iveryana*, which should find a place among all collections of these, as not only a first rate sort, but also a good forcer.

There were several exhibitors of *Camellias*, the most interesting of which were six very healthy and well flowered plants of *Storyi*, from Messrs Veitch; resembling, to some extent, old *imbricata*, but with larger flowers, and apparently more stiff and robust habit. The colour is a soft and pleasing red. This is a variety well worthy of cultivation. Mr Allnut and Mr Brown, gardener to W. C. Alston, Esq., were also exhibitors in this class, but had nothing of particular interest.

Boxes of cut *Roses* were furnished by Messrs Paul, of Cheshunt, and Mr Ingram, gardener to J. J. Blandy, Esq. Those of Messrs Paul were particularly beautiful, and well done, and might well have graced an exhibition table in the month of June. There were beautiful flowers of the lovely *Gloire de Dijon*, *General Jacqueminot*, *Prince Leon*, *Jules Margottin*, *Vicomtesse Decazes*, and other fine sorts. A bouquet of cutbloom of *Rose Ochroleuca* was sent by Mr Snow, gardener to Earl de Grey of Wrest Park; these consisted of a large bunch of half-expanded pale yellow buds, which were very much admired. It was stated that they were cut from a plant in a pot which had upwards of 40 buds on it. But the greatest novelty in the way of *Roses* consisted of a large plant of *Isabella Gray*, sent by Messrs Low, of Clapton Nurseries. It had suffered a good deal from travelling. It is, however, a most distinct thing in its way, and should it prove a free flowerer, and hardy, it must be a great acquisition to this class of *Roses*, known as the *Tea-scented*. In colour it may be said to be a good yellow, though not quite so deep in colour nor so double as the old yellow *Rose*.

A collection of well managed *Cinerarias* were furnished by Mr Turner, Slough; amongst which were several seedlings of promise, especially *Prince of Wales* and *Baroness de Rothchild*.

An extensive and good collection of *Hyacinths* and early *Tulips* were fur-

nished by Messrs Henderson, of Pine Apple Place; amongst which was a Tulip named Vermilion, remarkable for its brilliant—almost scarlet—colour, which must prove a most useful thing for decorative purposes.

Messrs Lee, of Hammersmith, and Mr Cutbush of Barnet, were contributors of collections of greenhouse plants. In that of the former was an immense bush of the peculiar-looking *Genesthyllus tulipifera*.

Two beautiful species of Amaryllids came from Mr Parker, of Hornsey, and from E. J. Henderson, of Wellington Road Nursery, a very peculiar-looking plant, *Rudgea leucocephala*, with large coarse-looking leaves, and a spike of white flower rising from the centre of the plant, on a short foot stalk.

The exhibition of vegetables was rather scant, and not over medium in quality. From Lewis Solomon, of Covent Garden, came Asparagus (a very small portion of which was eatable), new Potatoes, Early Horn Carrots, French Beans, Globe Artichokes, Lettuce; Mr Ingram produced Seakale, Potatoes, French Beans, Rhubarb, and a Cucumber far too old for table.

The Society's gardens furnished several ornamental greenhouse plants in pots and stands of cut flowers.

The Chairman, J. J. Blandy, Esq., read the following paper explanatory of his experience of Mr Thomson's triple retort boiler:—"The numerous articles which have lately appeared in the *Gardeners' Chronicle* and other horticultural publications show how deep an interest is felt on the subject of heating, and prove that the great desideratum at present is a method of heating by which the expense of fuel may be materially reduced, and I am sure I shall be excused if I occupy the meeting for a few minutes in giving the result of my own recent experience in this matter. I have for many years been an ardent lover of horticultural pursuits; I have several houses for various purposes, and have no fewer than seven boilers, five of which are of different constructions, but all considered to be good boilers; and certainly so far as their working powers go I have nothing to complain of, but the quantity of fuel which they consume is a very serious affair, and the consideration of the subject has often made me wonder that the science and enterprise which abound so largely with our practical gardeners have not led to the discovery of a cheaper if not a better mode of warming our hothouses than any which has hitherto been discovered. In the autumn of last year, one of my boilers being worn out, my attention was directed to a new one, then recently invented by Mr Thomson, the intelligent and experienced gardener at Dalkeith Gardens. I carefully read the description given of it; and it appeared to me that the principle was a good one, and I determined to try it. Accordingly in December last I had one fixed. The duty it has to perform is the heating a large plant stove and three ranges of forcing pits, altogether 225 feet of glass and nearly 1100 feet of piping—the greater part of this is 4-inch piping; six of the pits are in use for early forcing, the rest are occupied with bedding and stove plants, Strawberries, &c., so that it is requisite that the temperature should range in the different compartments from 50° to 70°; this is accomplished with the greatest ease, and I have not the slightest doubt but that the sphere of action might be much more extended with an equally successful result if required. The description of boiler is the triple retort. Coke only is burned, and in mild weather the whole of the work can be done with three bushels in 24 hours; and during the severest weather we have had this season, with snow and a cold cutting north-east wind, the work was done with a little under five bushels in 24 hours, the boiler giving as much heat as could be wished for in all the compartments with very little more fuel. I am confident the boiler would do more than double the work it has to perform, as I find the more it has to do the better it works: it heats quickly, and requires but little attention in the way of stoking, as it is only necessary to work it from 2½ to 3½ hours in the 24, according to the weather. During the remaining time the fire is banked close up, with the draught shut off. Personally I know nothing of Mr Thomson, but the conviction that his invention is a step in the right direction alone prompts me to bring it under notice, and I have only to add that if curiosity, business, or pleasure should

bring any of the Fellows of the Society into the neighbourhood of Reading, I shall be happy to see them and give them a hearty welcome to Highgrove."

CALENDAR OF OPERATIONS FOR MAY.

VEGETABLES.

The weather of late has been cold and wet, and by no means favourable for garden operations, and vegetation is later than usual. Apricots are now in full bloom, but the blossom is scarce this year; we have got in some seasons Apricots for a tart by this time (18th April.) What with planting, sowing, hoeing, and digging, there will be plenty to do in the kitchen garden. Broccoli and Brussels Sprouts may still be sown, but the sooner the better, and by the middle to the end of the month Cauliflower and German Greens for the last crop; also Parsley, Spinach, Turnips, and Salad material, and a good supply of sweet herbs; a good sowing of Peas should be put in from the middle to the end of the month; also Scarlet Runners and Kidney Beans on a warm border; prepare Celery ridges for an early crop; give plenty of air to the plants under glass, and plant before they are too large, and in dull weather; thin Onions as soon as they are ready, always keeping a reserve in case of an attack from the grub. Keep the weeds down; if they are allowed to seed, labour is increased, besides injury to many crops.

FORCING DEPARTMENT.

PINES.—Suckers that were potted early in the season will in most cases require a shift by the middle of this month. But in this, as in all similar cases, be guided most of all by the state of the plants. If those potted into 32's pots in February have gone on prosperously, they will be ready for a shift into 16's. In potting preserve every root entire, rubbing off any old loose soil from the shoulders of the ball, and placing them a little deeper in the pot than before. Press the soil firmly about the collar of the plant. By whatever means the bed in which they are to be plunged is heated, pay particular care that violent heat is guarded against, and if at any time it exceeds 90° take the usual precautions to prevent the roots from suffering. Do not over-crowd the plants in the pots, as there is now a rapid growing season before us; give them plenty of room. Keep them shaded for a few hours in the middle of bright days for a time, and sprinkle them overhead, and shut down close for a few days after their shift. See that fruit swelling off do not receive a check for lack of water, and an abundant supply of atmospheric moisture; give liberal waterings of liquid manure, and shut down early in the afternoon, allowing the thermometer to rise for an hour or two to 95°. Set fires agoing early in the afternoon in order to be able to compete with the cold nights which frequently occur at this season unexpectedly. Attend to last month's Calendar with regard to succession plants shifted early in spring.

VINES.—Give Grapes that are colouring a good supply of air, leaving a little on all night, and in fine days a little may be admitted by the front lights, and if it can be made to pass over or amongst the hot water pipes, all the better. It is almost indispensably necessary to the proper colouring and flavouring of Grapes that they be surrounded with a dry but warm atmosphere. Those just stoned and taking their final swelling should be encouraged with a high temperature and an abundant supply of moisture in the air. Should red spider make its appearance, there is no better means of getting rid of it than to rub over the pipes with a mixture of lime and sulphur, giving a little extra heat for an hour or two, and keeping the house close. Thin in good time both bunches and berries in succession houses, and be content with a fair crop instead of one ruinously heavy, as is so often the case. Where the Vines are in bloom keep them rather dry, especially Muscats, and disbud, stop, and tie in later houses as they may require it. Where the borders of early houses are inside, give a good watering, afterwards top-dressing

with short dung. Give Vines in pots intended for fruiting next year every encouragement. If not already done, get the earliest into their fruiting pots; give frequent waterings of liquid manure, and subject the foliage to as much light as possible, so as to insure a short-jointed and well-ripened cane. Weaker canes if thoroughly ripened will fruit better than others double the strength not properly matured.

PEACHES.—Early houses where the fruit is stoned should have an increase of temperature to 65° at night, with liberal syringings of tepid water; admit a little air early in the morning, and increase it gradually as the day advances, shutting up early in the afternoon with sun heat. Keep the young wood neatly tied in, and the fruit freely exposed to light and air. Disbud later houses as they may require, and do not by any means leave much more young wood than is necessary for another season. When trees are crowded, it is all but impossible to secure strong well ripened fruitful growth. These are subject to the attacks of mildew, red spider, and greenfly, which should respectively be kept in check by sulphur, frequent syringings, and tobacco smoke. See that there is no lack of moisture at the root, and a watering of liquid manure and a mulching will be of service to fruit swelling off.

ORCHARD HOUSE.—Continue to thin the fruit by degrees, but not finally till stoned in the case of stone fruit. Also attend to disbudding the shoots, so as not to allow the trees to become crowded. Maintain an incessant use of the syringe, so as to prevent red spider, and be careful that no check is sustained for lack of water at the root. Except in unfavourable weather, little or no fire heat will be required after the middle of the month.

STRAWBERRIES IN POTS.—Where there still remains a stock of these not yet introduced to pits or frames, no time should be lost in getting them in. After this season, it is desirable to bring on a quantity of these in cold frames, so as to come in just before those in most favourable spots in the open air. Those still in heat must be kept well supplied with moisture, otherwise they are sure to prove a pest with red spider.

CUCUMBERS AND MELONS.—Succession plants should be planted out this month to be principally depended on for autumn supply. Some good ridge variety and Gherkins should now be sown, and a ridge of dung and leaves prepared for their reception under hand-glasses by the end of the month. Mulch those that have been in bearing for some time with rotten dung, and keep them well watered. Plant out more Melons, and sow for later crops. For further directions, see former Calendars.

FLORISTS' FLOWERS.*

CINERARIAS.—These should be in full bloom this month; keep the plants as near to the glass as circumstances will permit. Shade from hot sunshine, so as to prolong their bloom; when done flowering, if seed is not wanted, the plants should be cut down and placed in a cold frame facing the north, or where they will be shaded from the mid-day sun. Sow seed as soon as it is ripe, which should be saved from the finest varieties by every known means. Keep down aphides and mildew.

FUCHSIAS.—Keep these growing on steadily; stop the shoots of any that have a tendency to be long-jointed; shift on all that require more pot room, taking care to give a good drainage, so the liquid manure may be applied once or twice a-week, when the pots get full of root. Syringe overhead every evening when the house is shut up; keep the temperature as regular as possible, which will be a great means of keeping the plants uniform. Destroy insects on their first appearance.

PANSIES.—These will be generally in bloom this month. If planted in a situation where they are exposed to wind, one or more neat stakes should be put to each plant, so as to prevent them from being broken over; or what is, perhaps, better, have them pegged down; water the beds freely in dry weather. Continue to put in cuttings; thin out the young shoots for this

* By Mr J. Downie, of Downie & Laird.

purpose. Autumn sown seedlings will now begin to show flower; these should be examined carefully every two or three days, and mark any that appear to possess good properties. Pansies in pots—keep as hardy as possible, thin out the young shoots, and put them in as cuttings. To encourage the weaker growing sorts, give them occasionally a little liquid manure water; protect from drenching rains, and cold cutting winds, frost, &c.

DAHLIAS.—A selection should be made at once of those plants intended for planting this season, and shifted into four or six-inch pots; use a rather rich soil; then place them on a gentle hotbed, and as near the glass as possible; give air on all occasions when the weather is favourable, so as to keep them from getting drawn up. About eight days before planting, which should be about the end of the month, remove the lights altogether during the day, so that they may be gradually hardened before they are turned out; and be careful that they receive no check from want of water, cold, &c.

PELARGONIUMS.—Remove all decayed foliage. Tie out the side shoots, so as to keep the plants uniform and in good shape. Give air freely in fine weather. In this month there is generally a succession of cold easterly winds, with bright sunshine during the day; in such weather, shut up early in the afternoon, and moisten the passages. Attend well to the watering of the plants; if possible, never allow them to flag for want of it; give a little liquid manure; water two or three times a-week; water fancies with care, and make sure that the drainage is all right. Fumigate once or twice just before the buds begin to open, as this cannot be done well afterwards without destroying the bloom. Mr Turner, of the Slough nurseries, adopts the following plan with his large plants; and any one who has seen the magnificent specimens produced by this gentleman must acknowledge it to be a good one; he places the pots on a little moss, and damps it morning and evening with manure water, which he finds greatly assists the plants.

HOLLYHOCKS.—For a succession of bloom, plant out immediately the strongest plants struck this spring; those produce fine spikes early in September. If not previously done, lose no time in getting seedlings planted out intended to flower this season. Should dry weather set in, let all have a liberal supply of water. Sow seed towards the end of the month, either in the open ground, or on a gentle hotbed.

CALCEOLARIAS.—Still shift on any that may require more pot room. Tie out the side shoots regularly as they advance; look well to greenfly. Those in flower shade from hot sunshine, and keep the atmosphere in the house cool; water occasionally with weak liquid manure.

CHRYSANTHEMUMS (LARGE).*—Tie the shoots as they advance, and turn round regularly; when all danger of frost is over, set them on beds of coal ashes in the warmest and most open place in the garden. When the specimens are well broke, re-pot into pots two sizes larger, and if a frame can be afforded them with a gentle bottom heat, plunge them into it, and give abundance of air. Should greenfly make its appearance, give them a pinch of Scotch snuff.

POMPONES.—When all the eyes are broke, re-pot into 6-inch pots, and tie out the shoots carefully as they grow; when they have grown three or four eyes, pinch again, and when well broke, pot into their blooming pots.

AZALEAS.—Those plants out of flower should be re-potted if required, and placed in a gentle heat, syringing over head in the evenings; keep as near the glass as possible, and give air on all favourable occasions; shade plants in bloom; give a little weak liquid manure to plants under-potted. Encourage young stock, re-pot as required, syringing freely, and pinch as their shoots advance.

EPACRIS.—Cut back all those out of bloom; examine the ball, and if required, re-pot into a size larger, and place in a close warm pit. Syringe over head once a day; as the young shoots advance, increase air accordingly, but be careful of cold draughts.

* By Mr Laing, Dysart Gardens.

AURICULAS.*—During the summer months keep these plants as much out of the sun as possible; allow them to have plenty of air; supply them regularly with water; keep them free from decaying leaves, and allow no decaying vegetable matter to remain in their vicinity; protect them from heavy rains. Moderate showers will do them no harm, but allow no water to lodge in the centre of the plants, for fear of inducing rot. Should seed not be wanted, pinch off the stems about two-thirds up. It weakens young plants to allow them to ripen seed.

POLYANTHUS.—Keep these plants as much in the shade as possible; in an airy situation; they may have all the rain that falls. See that they are not attacked by slugs, snails, and their deadly enemy the red spider.

TULIPS.—Keep the surface of the beds well stirred; allow them to get any warm rains, but protect from hail. So soon as the flowers show colour, get the top cloth over the stage, and shade while the sun is on the plants. After they are in colour they must not have any rain; but should the weather prove warm and dry during the bloom, the plants will be much refreshed by the paths being occasionally watered. Give all the air possible while the bloom lasts by rolling up the top cloth on the shady side of the bed.

PINKS.—Particular attention must be given during this month to insure a fine bloom. Keep the soil free from weeds. As the plants spindle for bloom, secure the stems to the blooming sticks. Slip all superfluous flower stems; two may be allowed to a strong plant, but only one to a weak one. Reduce the flower pods so soon as they can be slipped. Leave three on the strong growers, and on flowers that are full. Leave only two on the weaker sorts, and on varieties that bloom with few petals. Water liberally in dry weather. Attention to these hints will insure fine laced flowers for exhibition.

RANUNCULUS.—Continue to stir the surface soil occasionally, and allow no weeds to appear among the plants. Trust to rain, but in very dry weather a good watering may be given to the paths. Continue to keep worms in check by the application of lime water poured into their runs.

CARNATIONS AND PICOTEES.—Should the weather prove cold and wet as it was during this month last year, continue to afford the plants protection. In cold dry weather water in moderation, but in hot dry weather give copious waterings. Keep the plants clean from decaying foliage. Stir the surface soil whenever it becomes hard from the effects of frequent waterings or heavy rains; do this when the surface soil is in a dry state. Watch for greenfly and vermin of every sort. Greenfly can be easily destroyed by dusting strong snuff through a muslin bag over the plants infected; do this when the foliage is wet, for then the snuff adheres and kills them instantaneously. By the end of the month the blooming sticks will require to be placed in the pots. One stick will do for three plants; insert it in the middle of the plants; thrust it down to the bottom of the pot; tie the flower stems to it with a strip of Cuba bast, which will last the whole season; tie rather slack than tight for fear of injuring the flower stem.

NOTICES TO CORRESPONDENTS.

DAISY.—Your article will appear on your sending your name. This is required from correspondents not for publication, but as a guarantee of good faith on the part of the writers.

T. R., Arbroath.—Polyanthuses do well planted out after they have done flowering on a piece of ground where they are shaded from the mid-day sun. They should be lifted, divided, and re-potted about the end of September, using good rich soil. Add the following sorts to your collection:—

Beauty of England (Maud's).

Earl of Lincoln (Hafton's), Alexander (Parson's).

Kingfisher (Add's), Exile (Cronshaw's).

Lamer (Bullock), Cheshire Favourite (Saunders'), George IV. (Bucks).

* By Mr G. Lightbody, Falkirk.

W. ABBOT, Windermere.—The best dwarf Dahlias for bedding out purposes are:—Captain Ingram, colour, dark crimson, produces fine shaped flowers in great abundance, height about 18 inches.

Zelinda, is also a very dwarf sort, never growing above 18 inches high; colour, dark purple.

Prince Arthur, bright crimson, erect habit, height about 2 feet.

Crystal Palace, colour bright scarlet. Strong plants of this sort should be planted out early in poor soil; height, 2½ to 3 feet. This sort should be pegged down.

R. E. TAYLOR, Dunse.—To destroy the Gooseberry caterpillar on the first appearance of the insects go carefully over the bushes, and dust them with white hellebore; very little is required if taken in time. Any druggist in your neighbourhood will supply you with it.

F. F., Dunoon.—*Petunia alba magna* is the best white, either for exhibition or bedding out. *Marquis de St Innocent* is the best striped variety, and will answer your purpose well for exhibition. Try *Uncle Tom* as a dark for bedding. *Verbena*, Miss Trotter, will be let out the first week in May by Mr Parker, Paradise Nursery, Holloway, London, and for filling such a bed as you describe nothing would answer better than this beautiful variety; colour, deep scarlet, habit compact, and an exceedingly free bloomer. We venture to predict that when this sort is better known, it will be the most popular variety for bedding purposes extant.

J. ROBERTSON, Dumbarton.—The Bath or Clifton White Moss are one and the same Rose. The following notes by Mr G. Wilkinson, in *Turner's Florist* for 1854, will explain how the two names originated. In or about the year 1799, the same year in which Shailer's or the Unique White Moss was discovered, the nursery of the late Mr Jonathan Salter of Bath, a highly esteemed botanist and florist, was often visited by two ladies of the Society of Friends for the purpose of purchasing bouquets. On one occasion, while Mr Salter was cutting them some Red Moss Roses, they inquired if he had ever seen a white one. With an incredulity which could only be equalled by a similar question being now asked as to a Yellow Moss, he answered that not only had he never seen or heard of such a variety, but, at the same time, expressed his disbelief of its existence. The ladies assured him that they had seen several blossoms of it. Still, Mr Salter confessed that he must remain in doubt until he had not only seen, but examined it; this they promised to enable him to do, and in the course of a week they returned, and presented him much to his surprise and delight with seven or eight blooms, fortunately with long stems, and from these he succeeded in propagating about two dozen plants that season. On his enquiring as to the origin of this beautiful Rose, the ladies informed him that they had not seen the plant, but that it grew against an old wall in a garden near their house in the north; it was an old plant of the common red Moss, a branch of which had forced itself through the decayed bricks, and bloomed very freely on the other side. The first year it was found the blossoms were pink and pinkish white; but the second season every flower became perfectly white. Mr Salter having unfortunately neglected to enquire the locality of this, though not singular, yet strange sport, but certainly the west, which is generally considered entitled to the honour, is not its birth place. The recipient of this smile of fortune found his brother florists equally as incredulous as he himself had been as to the existence of this extraordinary novelty, and it was not until the plants had bloomed the following season that he could convince them of the fact. The stock remained in Mr Salter's hands the second season, and plants were charged a guinea for, when Mr Miller, of Durdham Down Nurseries, near Clifton, (now Messrs Garaway Mayes & Co.) became the purchasers of a large part of the stock, and finding that Mr Salter intended naming it the Bath White Moss, Mr Miller preferred sending it out as the Clifton White Moss, and thus arose an *alias* which had puzzled many Rose growers to account for. Most amateurs are doubtless aware of the sporting inclination which this variety still retains, particularly when grown strongly; it will frequently come light pink, and one variety of the Blush Moss was, we believe, thus obtained. Sometimes it has Rose-coloured stripes on the petals, and I once flowered it half white and half red; however, when growing in a situation congenial to its somewhat delicate habit, it must be acknowledged from its retaining so much of the similitude of its parent's beautiful calyx, that a bud of Rose is one of the most recherche bridal flowers in existence.

ERRATA.—Page 167 line 8 and line 12, for germination read gemmation; also, in some copies, page 168, for *Rosa Camia* read *Rosa Canina*.

THE SCOTTISH GARDENER.

THE BEAUTY OF NATURE IN RELATION TO LANDSCAPE GARDENING.

No. 3.—PERSPECTIVE AS A SOURCE OF THE BEAUTIFUL.

IN a former paper on "The Gardenesque Style of Planting," while adverting to the principle in our visual perceptions, which is called by Dr Reid "The Geometry of Visibles," we remarked that that principle had been in great measure overlooked, and that it was destined to form a chapter in the theory of objective beauty when it shall be more fully investigated than it has been. Without professing to supply this defect completely, we shall offer a few observations which may serve at least to direct attention to the subject. It is not quite correct, however, to assign this principle wholly to the sphere of the objective or external; it is rather something between the objective and the subjective or internal, though it is more nearly connected with the former than the latter. It is, in short, the geometrical relation of the eye of the spectator to one or more of the countless objects which he contemplates as existing around him.

Sir William Hamilton, in his notes on "Reid's Inquiry into the Human Mind," intimates his opinion that the Geometry of Visibles does not differ from the doctrine of Perspective; and unquestionably he is right, if he refers to what may be called Natural Perspective, in contradistinction to Pictorial Perspective. The difference between these two kinds of Perspective will bring our present subject distinctly before us.

The Perspective of painters is the art of representing objects which exist in space of three dimensions on space of two; that is, on a plane surface. The effects of this process are often very surprising, and yet they are amenable to the natural laws of vision, in respect to form and colour; and as such have been treated in tech-

nical books in a mathematical way ; at present we must content ourselves with some simple illustration. Let a person, then, station himself inside a window from which an extensive view may be obtained ; let him look first at the objects without, and then, without wholly abstracting his attention from them, observe where each of them seems to meet the panes of glass. He will remark that the nearest objects are bounded by the lowest edge of the lowest panes, and that, in proportion as the ground recedes, it gradually ascends till the horizon is reached, which is the highest of all, except, perhaps, the trees or buildings in the foreground, past which he looks into the distance. The points on the glass, passed through by the visual rays from without, were they marked on the window, would form a correct picture. The spectator, looking through the window, has only to add to his former observations accurate perceptions of the softening of colours and the dimming of forms, which constitute Aerial Perspective, and he is in possession of the whole theory of the method by which a landscape of many miles of length and breadth, and many thousand yards in height, may be transferred to a flat surface of a few feet square. A plano-convex mirror, or what painters call a Claude Lorraine glass, will give a beautiful illustration of this process. A still commoner, and perhaps more complete illustration is afforded by a landscape photograph, in which the natural artist, light, observes perspective with an exactness unrivalled in the works of men.

The Perspective of nature makes no reference to a flat surface existing between the objects and the eye, as in an ordinary picture, or opposite to the objects, as in a mirror and a photograph. If the objects are conceived to be projected on aught, it is on the imaginary surface of a great sphere, which always seems to bound the vision of a spectator placed at any point in the universe. Probably, however, this projection is seldom consciously made, except when the thoughts are actively engaged in studying the subject. Objects at some distance, though known to be in relief, are mostly regarded merely as forms of flat space, and are, as it were the bases of irregular pyramids of rays proceeding from them to the eye. Effects of the most varied description are produced on the sense of sight and on the mind, but, for the most part, unconsciously, so far as the *rationale* of the process is concerned ; for, accustomed as we are to the presence of nature, we are generally content to observe and admire, without considering the geometrical principles, which enter into our perceptions in this sphere of Beauty.

These two kinds of Perspective, though they are not quite the same, have many things in common. The manner, for example, in which form is painted in the one, and is presented to the eye in the other, is identical. Let the reader cut out a circle of white card, and let him suspend it by a thread, at some distance, where it may hang freely. When his eye is exactly in the plane of the card, he sees only a white straight line, of the length of the diameter : as he

changes his position, the line widens into an ellipse, or oval, which continually increases in breadth, till the eye, coming into the line which is perpendicular to the centre of the plane, beholds a perfect circle. So, a square piece of card may be made to appear to the eye a straight line, an oblong narrow or broad, a rhombus, or a rhomboid ; while only in one position does it seem a perfect square. Similar apparent mutations take place in other figures. Pictorial Perspective represents figures on a flat surface in *apparent* relief ; Natural Perspective presents them *real* relief, visible, except at considerable distances. The ingenious instrument, the "Stereoscope," gives a charming illustration of the two kinds of Perspective. Let us suppose a slide with, as usual, two copies of the same design—say a picture of a group of statuary. Let us look, first, at the couple of engravings on the flat surface : that is an example of Pictorial Perspective. Let us introduce the slide into the instrument and apply the eyes ; immediately the two pictures are converted into one, and the figures stand out in relief, as if they were actually minute sculptures of marble. That is an instance of Natural Perspective.

We have looked into this subject, it may seem, more minutely than necessary ; but we could not have rendered it intelligible in any other way. Our purpose, however, in these papers is not so much to direct the formation of Beauty as to point out the sources of it. We shall, therefore, consider a little further the results of this relation of the eye of the observer to the external world. The effects of Natural Perspective are well described by Ralph Waldo Emerson in his "Essay on Nature."

"Such is the constitution of all things, or such the plastic power of the human eye, that the primary forms, as the sky, the mountain, the tree, the animal, give us delight *in and for themselves* ; a pleasure arising from outline, colour, motion, and grouping. This seems partly owing to the eye itself. The eye is the best of artists. By the mutual action of its structure, and of the laws of light, Perspective is produced, which integrates every mass of objects, of what character soever, into a well-coloured and shaded globe, so that where the particular objects are mean and uninteresting, the landscape, which they compose, is round and symmetrical. And as the eye is the best composer, so light is the best of painters. * * * The influence of forms and actions in Nature is so needful to man, that in its lowest functions it seems to lie on the confines of Commodity and Beauty. To the body and mind which have been cramped by noxious work or company, Nature is medicinal and restores their tone. The tradesman and the attorney comes out of the din and craft of the street, and sees the sky and woods, and is a man again. In their eternal calm he finds himself. The health of the eye seems to demand a horizon. We never are tired so long as we can see far enough. But at other hours Nature satisfies the soul purely by its loveliness, and without any mixture of corporeal benefit. I have seen the spectacle of the morning from the hill-top over against my house,

from day-break to sunrise, with emotions which an angel might share. The long slender bars of cloud float like fishes in the sea of crimson light. From the earth, as a shore, I look out into that silent sea. I seem to partake its rapid transformations: the active enchantment reaches my dust, and I dilate and conspire with the morning wind. How does nature etherealise us with a few and cheap elements. Give me health and a day, and I will make the pomp of emperors ridiculous. The dawn is my Assyria; the sunset and moonrise my Paphos, and unimaginable realms of faerie; broad noon shall be my England of the senses, and the understanding; the night shall be my Germany of mystic philosophy and dreams."

We could not prevail on ourselves to withhold from our readers any part of this beautiful extract, though its eloquent and mystic author introduces into it some elements, and indulges in some imaginings, which are not strictly akin to our subject. Let us betake ourselves to more prosaic observation. Contemplate, then, a tree, standing even on level ground; how diversified its form when viewed from different sides. Take another on a slope: how much more varied still, when looked at from below, or from above, or in angular directions. Place it on the sky-line, and it seems almost doubled in size. Lately, in a misty spring evening, we observed a hare on a sky-line, not far from the eye, and we thought it a greyhound, till its peculiar bounding gait betrayed to us the true character of the animal. And if the appearance of a single object thus varies in perspective, not less is the variation of a group, considered either in itself or more particularly in relation to other groups. As we move about, a thousand parallaxes of visible things are increasing and diminishing continually around us. Observe a group of trees on the face of a rocky hill: seen from below, it is like a lock of hair on the mountain's brow; seen from a horizontal position, at a distance, it starts out like a moustache on the grim visage of the precipice; and seen from the beetling crags above, it resembles the tressy tangled crown of one of the unkempt children of nature. Every object in the external world assumes numerous phases in obedience to the laws of Perspective. The house in which we are now writing is situated in the upper part of a narrow valley, at a point from which the ground rises at various inclinations, and in all directions save one. At a salient point of the neighbouring hill, on the north, the structure is seen in almost isometrical projection. From an opposite station on the south, it appears on a level platform, embowered in a thicket of trees. Looking down the valley, it is nearly hid by the small adjacent hamlet, and the village church; and looking up the valley, it seems to stand on a slope, with a low amphitheatre of ground beyond it. Almost every point of view has a different level, and presents the house in connection with different objects; and hence, with few elements of the picturesque in its vicinage, it nevertheless is endowed with many pleasing aspects,

from the principle of Perspective alone. It will be readily understood how the same principle applies to the larger objects in Nature, such as swellings of the ground, eminences, rocks, hills, mountains, river scenery, lakes, and even seas.

Natural Perspective produces many other pleasing effects. Looking out from the horizontal branches of a thick grove, on a summer's day, how comparatively distant, yet how sunny and brilliant, do we think the outward and open country to be. How far off does a long narrow avenue throw the obelisk at its extremity. A view from the interior of a cave exhibits all these appearances; such as they are finely described by Wordsworth, in the beginning of his "Excursion":—

"Pleasant to him who on the soft cool moss
Extends his careless limbs along the front
Of some huge cave, whose rocky ceiling casts
A twilight of its own, an ample shade,
Where the wren warbles; while the dreaming man,
Half conscious of the soothing melody,
With side-long eye looks out upon the scene,
By power of that impending covert thrown
To finer distance."

The pleasure derived from Natural Perspective is much greater than can be readily supposed by those who have not carefully analysed their ideas of the Beautiful. Some years ago, the writer of these remarks was induced to study attentively the forms of trees; and since then he has scarcely seen a fine tree without considering it in that character. His sense of the beautiful in trees has increased; and, if not in the exact proportion of his knowledge, yet it has become vastly more rational and intelligent. He can now admire, and know why he admires. It is possible, indeed, for thousands unconsciously to derive pleasure from a principle which is a law of their being, and which rather possesses them than is known to be possessed by them. There are, doubtless, thousands that never heard the name of Perspective who have drunk in delight, from the picturesque forms of Nature, the rich garniture of the fields, the witchery of the clouds and the deep blue sky, and night, with her stately moon and solemn shades, "setting off the forms of things." The student of the Beautiful will desire to admire for himself, and will endeavour to be ready to give a reason for the taste that is in him. He will seek to see effects with his own eyes, and to explain them to his own reason. And whether or not he concurs with the poet recently quoted in ascribing an equal amount of knowledge to the swain addressed in the following lines, he will, at least, aspire to a similar initiation into the mysteries of nature:

"Can written book
Teach what *they* learn? Up, hardy mountaineer!
And guide the Bard, ambitious to be one
Of Nature's privy council, as thou art,

On cloud-sequestered heights, that see and hear
 To what dread power He delegates his part
 On earth who works in the heaven of heavens alone."
Wordsworth's Works, Vol. vi., p. 18.
 S.

THE THEORY AND PRACTICE OF HORTICULTURE.

NO. 8.—DEGENERATION IN THE CULTIVATED VARIETIES OF FRUITS AND FLOWERS.

IN returning to this discussion, we beg to remind our readers of the points at issue between Dr Lindley and ourselves. There is little or no difference, then, in regard to facts—so far, at least, as Apple and Pear Trees, Potatoes, and certain Florists' Flowers are concerned. Some counter facts, indeed, have been stated in the *Gardeners' Chronicle*; and these, in their bearing on the matter in hand, we endeavoured to appreciate in our last paper. We, besides, surrendered provisionally to a writer in the *Florist* the principle of degeneration in Dahlias, as not yet sufficiently established by evidence. The facts, then, being for the most part admitted on both sides, it is when we come to give to the facts a theoretical explanation that our dissidence appears. Dr Lindley, as may be seen from his replies in the *Gardeners' Chronicle*, has laid out his whole strength in explanations; and if these are not valid, he has said little or nothing to the purpose. Two theories have been broached on the subject, one by Mr Knight, and one, or rather one with an appendix, by Dr Lindley. As much mis-apprehension still exists regarding these theories, at the risk of being tedious, we must give a brief account of them again.

Mr Knight's theory (so far, at least, as we hold it) may be stated as follows:—Primary plants, meaning thereby plants raised directly from seed, whether of the natural species or of the seminal varieties, are, like other organised beings, endowed with a certain amount of vital force, different in different kinds, and capable of being diminished or increased in its duration by external circumstances. The principal means of the extension of this original vital force are grafting, and other methods of propagation by division. This extension cannot be carried on indefinitely, for exhaustion or decay at length appears. The secondary or propagated plants partake of the constitution of their parents; and all the secondaries, belonging to each primary, form in a lax sense one individual, and have a sort of common life. The tendency to exhaustion or decay is more visible in the cultivated varieties than in the natural species, because the former have a more artificial constitution than the latter, and because their individuality can be more easily traced, and their history is better known.

We should have been glad to give Dr Lindley's theory in his own words, but we can find no brief quotable statement of it. The following, with every desire to be impartial, we have gathered from "the Theory and Practice of Horticulture," and the *Gardeners' Chronicle*.—Species are eternal, and so are varieties, for there is no physiological difference between them. Individual plants, which are perennial, and particularly trees, are also eternal, and would never die but for external causes, or diseases produced by such causes. There is no intrinsic limitation of the vital forces, nor is there any inherent tendency to decay. Grafting or other methods of propagation by division, applied at the right time, and in the right way, extend the existence of plants derived from semination, by infinite series, "into the limitless future." Disease, however, when it has occurred, may be propagated, and though curable when taken in time, may become hereditary, and even be so intensified as to exterminate unfortunate varieties, which cannot with certainty be renewed from seed, as the individuals of the species may be. To this, his general theory, Dr Lindley has added a sort of appendicular one, to neutralise the facts which apparently favour Mr Knight; and this latter can fortunately be given in his own words:—

"All the cases (of degeneracy) quoted or quotable are those of varieties raised long enough ago to have fallen into decrepitude, from neglect, during that dark time in English gardening which intervened between the middle of the eighteenth century and the beginning of the nineteenth. Our theory is, that during this period fruit trees, when cultivated as open standards, were allowed to run wild and fall into bad health; that when cuttings were taken from them for propagation they carried disease with them, which disease, acquiring more and more intensity, ultimately exterminated them, except in a few places."—*Gardener's Chronicle*, 1857, p. 100.

To Dr Lindley's general theory we offered some objections in our December number, which, as nothing hitherto has been said against them, and without assuming that nothing can be said, we shall consider sufficient for the present. As to the more particular theory, we remark, (1), that the cause assigned for the decay, or even partial disappearance, of certain sorts of Apples and Pears, is *Disease*, and disease as distinguished from degeneration. Disease is affirmed—degeneration is denied. Dr Lindley continues the passage above quoted by saying:—"This view seems to us to be consistent with the fact that some diseased varieties recover health when placed in favourable situations, as Madeira or the United States, which is wholly inconsistent with the hypothesis of degeneration." Mr Knight saw no inconsistency between his theory and the fact alluded to, when contemplated in its proper meaning and magnitude. "It appears probable," he says, "that the latter period of the existence of the Apple tree would be considerably prolonged in a southern climate, for all the old kinds grow best in warm situations, and the most diseased flourished with greatest vigour when I trained them to a south wall." (*Treatise on the Apple and Pear*, p. 17.) Perhaps it may be thought that Dr Lindley is more logical on this point

than Mr Knight;—people are always more logical in carrying out their neighbours' theories than their own;—but to us it seems one thing to prolong the existence of a diseased plant, and another thing to re-establish it in perfect health. The complete recovery of the fruit trees carried to Madeira remains to be proved; but we have discussed this point already, and we need not go over it again.

Reverting to Dr Lindley's subordinate theory, we remark, (2), that, in respect to the propagation of disease, and its assumption of a hereditary and intensified form, he is in exact accord with Mr Knight. Dr Lindley evidently admits that secondary trees may acquire the depraved constitutions of their primaries, or of those from which they have been grafted. This is surely a near approach to the idea of a common life.

But (3) the most remarkable point in Dr Lindley's additional theory is the account which he gives of the origination of the diseases which have committed such dire ravages among the fruit trees of England. These, it seems, were generated in the dark time intervening between 1750 and 1800, when everything was allowed to grow wild. We have already intimated our doubts on this part of the theory; and the more we think of it the more do our doubts increase. We cannot bring ourselves to conceive of the age of Miller, Speechly, Abercrombie, and Knight, as a dark time, at least in comparison with the century that went before it. Unquestionably, in the majority of the orchards of England, there was as much darkness during the first half of the last century and the first half of the present, as in the period specified by Dr Lindley. Mr Macintosh tells us that he had ocular proof—we presume within the last fifty years—that in the orchards of Herefordshire matters were as bad as they could be. Dr Lindley himself affirms, that at the present day the Oak plantations in the south are as much cultivated as the orchards are. Again, this theory of the origination of disease explains only a part of the facts. It does not account for this fact, at least, that only a portion of the sorts of Apples and Pears were damaged by passing through the dark time, while another, and perhaps larger, portion effected their passage unscathed. Besides, it surely cannot be pretended that all the Apple and Pear trees in England were in the neglected orchards, or were grown as standards. Surely there were some Apple and Pear trees on the walls at Welbeck, and the other well-kept gardens of the period. Much less can it be proved, that all the nurserymen in England procured all their scions from the neglected orchards. If, as is most probable, they followed the practice of their successors in the present day, they took their grafts from their own rows of young trees, they certainly did not propagate the disease that prevailed in the outfields of Herefordshire and elsewhere. Lastly, Dr Lindley's theory does not explain the prevalence of disease among numerous Scottish varieties, such as the Oslin Pippin and Grey Leadington Apples, and the Crawford, Benvie, and Drummond Pears, and many others of both

classes, which were never in the old English orchards, and were hardly known in the latitude of London till they were assembled in the garden of the London Horticultural Society. Dr Lindley must not tell us that our fruit gardens were ever so neglected as he says the orchards in England were and are. We assure him emphatically that such has not been the case. We have the authority of Dr Lyell for stating that the gardens at Newburgh, in which, as recorded by him in our last number, the Crawford and Benvie Pears, (and he could have added a dozen of other Pears and Apples,) have so much deteriorated, have been kept, for the most part, under the usual routine of vegetable cropping. We can make a similar affirmation relative to other parts of the country. We remember an old kitchen garden, long kept with the utmost care, in which, about 1812, there were trees of Redstreak, Oslin Pippin, Nonsuch, and Grey Leadington Apples, and Black Achan, Crawford, and other Pears—trees which had been probably planted before 1750, and which, when we knew them, were in the last stage of decay. In the latter case, we know the trees had not been neglected: they had not, indeed, had the benefit of root pruning, which was unknown in those days, but they had undergone the most approved culture of the time. We, therefore, humbly submit that Dr Lindley's theory of the origination of disease is inadequate to account for the whole phenomena, and is inept as a polemic against Mr Knight. That the influences, to which he alludes, aided in precipitating the general decay of the sorts in question, and completed it in thousands of individual trees, cannot be doubted: that it was the sole cause of the decay, or that it would have had any such effect at all, had there not been innate susceptibilities for disease on the part of many sorts of trees, is evidently one of the paradoxes of the truth of which ingenious men not unfrequently succeed in persuading themselves.

We may remark, in passing, that notwithstanding Dr Lindley's principle of the eternity of species and varieties, the diseases of plants loom before his eyes in frightful magnitude. All our favourite varieties of Potatoes he holds to be diseased. They are like the over-fed geese of Strasburg, with monstrous livers! (*Gardeners' Chronicle*, 1857, p. 212.) So, it seems, are our Turnips, Carrots, &c. "Some facts tend to show that many of our most esteemed garden plants are the result of debility, and that the succulence, the sweetness, or the excessive size which render them so well suited for food, are only marks of unhealthiness." (*Theory and Practice of Horticulture*, p. 467.) We do not see how our Cereals, on a parity of reasoning, can evade the sweep of this principle. Our Fenton Wheat, it should seem, is only *Ægilops ovata* in a state of plethora. The Potato Oat is an over-gorged form of a grass, which is possibly not an *Avena*, as may yet come out, when M. Esprit Fabre extends his researches in this direction. So, the Chevalier Barley is a *Hordeum*, perhaps, somewhat in the shape of a Strasburg goose, with a monstrous liver. It is no wonder that the Geographical

Botanists have been unable to discover the native countries of the Cereals. Our favourite Grains, it would appear, are not diseased because they are cultivated; but they are cultivated because they are diseased. What do you say to this conclusion, Messieurs Alarmists? Our very staff of life, it would appear, is a mass of disease; and how can *we* be otherwise?

But let us calm our apprehensions, and return with due sobriety to the subject before us. Mr Knight, like Dr Lindley, employs the idea of disease; it is, indeed, his principal form of decay, but in his hands it assumes no exaggerated shape. His first communication to the Royal Society, in 1795, begins with the sentence:—"The disease from whose ravages Apple and Pear trees suffer most is the canker." It may surprise our readers to be told that Mr Knight, while he speaks very frequently of the diseases and decay of fruit trees, never uses the word *degeneration* in any one solitary instance which we have been able to discover, though the term was in common use before his time, as will be seen by extracts from Maddox, hereinafter to be given. Only on one occasion he employs the expression "worn-out trees;" but plainly considering it as synonymous with "diseased" or "decayed trees." Dr Lindley's favourite phrase, we observe, is "the wearing out of the races," though he, too, occasionally speaks of "degeneracy," or "degeneration." It was partly from his writings, and partly from the current horticultural literature of the day, that we adopted the terms "degeneration" and "wearing out." And why do we indulge in this verbal criticism? In order that we may protest, as strongly as possible, that if these terms, "degeneration" and "wearing out," are to be held as representative of Mr Knight's theory, they ought to be understood in a sense which is consistent with that theory. Surely it is only common fairness that Mr Knight's theory should be contemplated in the light of his own facts and the sense of his own reasonings. Dr Lindley has done the very opposite. After giving a large extract from pp. 335, 336, of our volume for last year, as a specimen of our reasonings in defence of Mr Knight, he turns suddenly round on us with the remark—"We wonder that so acute a writer should not have seen how inconsistent with Mr Knight's theory is his own argument." (*Gardeners' Chronicle*, 1857, p. 100.) We fear our supposed acuteness has forsaken us altogether, for we have not yet seen what Dr Lindley wonders we did not see; nay, more, we confess that we cannot understand the remark in a sense which is consistent with the known manliness and intelligence of Dr Lindley. Had he said that our argument was inconsistent with his own theory—as he indeed attempts to show—his assertion would have been intelligible enough. Will our readers believe it?—the facts which form the staple of our argument are just the facts adduced by Mr Knight himself, only a little amplified by additional facts from our own experience. There is absolutely nothing novel in them—not even the idea of sickly plants going to the south for their health.

And the form in which the facts are arranged in the argument is, we verily believe, precisely that which Mr Knight would have adopted, had he been alive to defend himself against Dr Lindley, for it is strictly analogous to the manner in which he used to present his views; and it is the simplest and most direct that can be devised. If, then, our facts are inconsistent with Mr Knight's theory, unquestionably Mr Knight's own facts were equally inconsistent with it. If our argument is inconsistent with that theory, so also were Mr Knight's arguments. Whatever may be thought of our acuteness, it was never imagined that Mr Knight was extremely deficient in that quality, and, still less, that he was deficient in strong broad English common sense; and yet, it seems, the facts which suggested to him his theory, and the reasonings by which he defended it, were inconsistent with that theory. That, we must be permitted to say, we cannot believe.

Speaking of theories has led us to theorize on the possible meaning of Dr Lindley's strange assertion, and, at the risk of again endangering our reputation for acuteness, we may mention two hypotheses at which we have arrived. Our first impression was, that he was endeavouring to get quit of a troublesome argument by throwing dust in the eyes of his credulous readers; and that he found it easiest to do so by a bold statement, the validity of which few would take the trouble to examine. Our second conclusion, however, and that by which we abide, is, that Dr Lindley, in his ordinary habits of thinking, has contrived to attach ideas to the terms "degeneration," &c., which appear to him inconsistent with what he supposes to be the theory of Mr Knight, and so has slid into the fancy that what were really Mr Knight's views were inconsistent with his theory. We repeat that Mr Knight is not responsible for the terms "degeneration" and "wearing out." They are, perhaps, not strictly convertible, but they apply with sufficient accuracy to separate parts of the train of phenomena which inquiries on this subject have brought to light. In disputes about words, it is a common practice to have recourse to the Lexicographers, but it is useless to do so on the present occasion, for here, as generally indeed, it is not the terms that give meaning to the facts, but the facts that give meaning to the terms. Let us, then, make a brief analysis of the facts or phenomena; and let us ascertain what they tell on the subject.

I. Varieties which are the results of high culture invariably degenerate, when there is any intermission in the appliances to which they owe their origin. For this we have the high authority of Dr Lindley himself:—"There can be no doubt that, if the arts of cultivation were abandoned for only a very few years, all the annual varieties of our gardens would disappear, and be replaced by a few original forms." (*Theory and Practice of Horticulture*, p. 465.) *Nemophila maculata* and *N. discoidalis*, as the seedsmen call them, were they sown in a "flower prairie" in California, would speedily return into *N. insignis* and *N. atomaria*. A field of Wheat, aban-

doned to itself, if the plants did not wholly disappear at the end of the second year, or were not choked with the natural herbage, would, according to the story of M. Fabre, revert into *Ægilops ovata*. We have no doubt that plants, not annual, would follow the same retrogressive law. One of Mr Turner's finest show Dahlias, planted out, along with its barbarian cousins, in a Mexican sandy meadow, if it survived the first revolution of the seasons, would doubtless become ere long semi-double : it would probably shed its seeds, and its progeny, in two or three removes, would resume the original form of the species, with a single row of purple florets in the ray. Perhaps Dr Lindley will say—"Yes; but you have got the species, which is healthier than the variety." To this we reply, *first*, there are numerous extinctions in the process—in the abandoned field of Wheat, for instance, they would amount to millions; and, *secondly*, we have lost the variety, and all the qualities for which the variety was valued and cultivated. That this latter case is rightly called "*degeneration*" is established by a venerable authority, which we cite in all reverence, not to prove a fact in natural history, but to exemplify a usage of language, the *usus loquendi*, as the verbal critics call it:—"I had planted thee a noble Vine, wholly a right seed: how then art thou turned into the *degenerate* plant of a strange (unknown or wild) Vine." (Jer. ii., 22.)

II. Another form—that, namely, of "*wearing out*"—is exhibited by certain florists' flowers, such as the Anemone, Ranunculus, and, we must still add, the Hyacinth. We quote from *The Florists' Directory*, by Maddox, 1792, as cited by Dr Lindley (*Theory, &c.*, p. 479):—"The Anemone will not last more than twelve or fifteen years without degenerating, unless it be frequently removed to a different soil and situation; nor will any removal protract or prolong its existence more than thirty or forty years." Again:—"The Ranunculus will last about twenty or twenty-five years in perfection, after which it degenerates and perishes." The late Mr R. Lyburn of Kilmarnock, a man of high talent, who, if he had been spared to science, might have disputed the sceptre of Physiological Horticulture with Dr Lindley, remarked:—"In beds of Ranunculus flowers it is easy to pick out the varieties recently raised from seed from the older varieties, by the greater vigour of the plant. The older varieties of Dahlia, whether from neglect or decay, are not so vigorous as they were at coming out. It is the case with newly-raised Carnations and flowers in general." (*Loudon's Gard. Mag.*, Vol. xviii. p. 526.) We can bear personal testimony in confirmation of the above, so far, at least, as the Ranunculus is concerned. Every grower of that fine flower knows that while the sorts recently raised from seed are extremely vigorous, the older varieties become "fine by degrees and beautifully less," till they vanish altogether. Dr Lindley endeavours to neutralize the proof from florists' flowers, by saying that the plants in question are very short-lived species—the natural species as well as the cultivated varieties. That is pre-

cisely our case. Nature has allotted to them a brief span of existence, which cannot be materially prolonged. We are not going to repeat Dr Lindley's mistake of "true in one thing true in all;" but we maintain, that in certain genera we have undoubted instances of the principle of "wearing out," and, therefore, that principle, as affirmed by Mr Knight, is not so unexampled or unheard of as physiologists would have us to suppose.

III. Decay assumes the form of disease. We have already said that this was the aspect in which it chiefly presented itself to the eyes of Mr Knight. Admitting, for the sake of argument, that there is a tendency in plants to degenerate, it is not wonderful that the tendency should appear in diversified forms;—that annuals should degenerate in one way—that tuberous and bulbous-rooted plants should wear out in a second—and that woody arborescent plants should undergo the one or the other process, if they be really different, in a third, viz., disease. Canker is the main form of disease in the races of Apples and Pears, and there is no question that it has been extremely prevalent, and has brought some of the older varieties to the borders of extinction. Dr Lindley says of them, they "are irrecoverable, perhaps, but not necessarily worn out." (*Gardeners' Chronicle*, 1857, p. 100.) We understand by this that he denies that disease is degeneration; but to this we reply that such an application of the word is not unheard of, as is proved by the title of a work by one of our foremost medical men, viz., "The Granular Degeneration of the Kidney," by which, we understand, an almost incurable malady, commonly called "Bright's disease," is designated. We suppose that the profound and highly accomplished Christison would smile his gravest if he were told that the title of his book is a misnomer, for disease is not degeneration. The dispute, however, is not about words, nor about the existence of disease, but rather about how the undeniable disease originates, whether, namely, from inherent constitutional tendencies, or from accidental and extrinsic circumstances in particular cases. This brings the two theories once more into direct collision before us.

The only argument advanced by Dr Lindley to show that the admitted disease is not degeneration in the sense in which that word is understood by the adherents of Mr Knight, is, that diseased varieties have been known to be cured by removal to a warmer climate. To this we have already more than once answered, that, to make this argument valid, Dr Lindley must demonstrate that the cure is perfect and permanent. This he has not yet done. For aught that has been shown hitherto, the apparent restoration may be only temporary.

But, on the other hand, it may be asked, what is the testimony which the phenomena of disease bear to the principle of limited duration, as affirmed by Mr Knight's theory? Surely that testimony will not be denied in cases where the disease is aboriginal? Mr Knight "found that many of the young [seedling] plants—

particularly those from the Golden Pippin—were nearly as much diseased as the plants which produced them." (*Treatise on the Apple and Pear*, p. 25.) Dr Lindley, indirectly at least, admits the same thing as to our favourite varieties of Potato. That species, he says, "is highly manured, over-fed, and constantly forced into a state of fecundity foreign to its nature. From the time that it is gained till it disappears it is the victim of man's unkindness. The Strasburg geese, which are fattened for the sake of their monstrous livers, perish long before the end of the time allotted to a goose's life. But we do not say that they degenerate, nor is it pretended that the race of such geese is wearing out. They die of too much and unnatural feeding. That we conceive to be the history of the disappearance of races of Potatoes." (*Gardeners' Chronicle*, 1857, p. 212.) With regard to the argument in this citation, we have to say, *first*, that we always understood that the Strasburg geese, with monstrous livers, died because they had their throats cut, and not simply on account of their "too much and unnatural feeding," though, doubtless, that over-feeding would also be a sufficient cause for the shortening of their lives, if they were left to themselves; and, *secondly*, we say that, if the geese at Strasburg were born with monstrous livers, the race would speedily wear out in that epicurean city. It is, however, more with the fact than with the argument that we have at present to do. Dr Lindley admits, or rather affirms, that our favourite Potatoes, from "the time that they are gained," are diseased: in other words, that the disease is congenital. Unquestionably, it is in the seed-bed that they acquire the constitutional character, whether it is rightly called disease or not. In certain seedling Apple trees, then, and in most varieties of Potatoes, disease is innate, inherent—in short, is a law of their being,—it only requires time to develop itself; or, to use Dr Lindley's words, it "becomes more concentrated in each succeeding generation, till at last the powers of nature give way, and it dies of debility." We do not see how the principle of the limitation of the vital forces can be denied in such cases.

The question, however, may seem of more difficult solution when we take up the case of fruit trees, which are apparently healthy at their origin as varieties, but which are found to be generally diseased at a later period of their history. We frankly acknowledge that here the direct evidence is scanty, from our having so few memorials of the dates at which particular varieties originated. The Winter Redstreak, it is said, was raised in 1634, and we know that in 1795 it was in a state of decay. The Ribston Pippin originated, according to Mr G. Lindley, about 1688, and it is every year sinking more and more into debility. A few other dates are probably known to antiquarian pomologists; but the origin of the great mass of the older and decaying varieties has obtained no record. Of course, in this absence of historical data, we can have recourse only to presumptions or analogies; and these, as they seem to us, are all

in favour of Mr Knight. Let us attend to a few of them:—

1. Let it be considered, then, that nature does not advance by leaps. It is surely not incredible that many gradations in health and other constitutional tendencies should originally exist between the seedling Golden Pippins, which were found to be in a state of congenital disease, and the seedling Wilding Crabs, which, without any theoretical leanings, we may say, possess the normal health of the species. At all events, looking at the condition of the varieties of a species at any given time—of the Pear tree, for example—we undeniably discover a gradation in robustness of growth, hardness of blossom—in a word, health, forming a series beginning with Autumn Bergamotte, Jargonelle, &c., at the one end, and terminating in the Kilwinning, Monteith, Gold Knap, and similar Scotch varieties which approach indefinitely near the Wilding Pear, on the other. It would be easy to indicate a similar series in the sorts of Apples, and also of cultivated Roses. Now, we occasionally find disease even in the extreme members of the series, where the varieties vanish into the natural species; and we find a susceptibility of disease at every point along the line. We everywhere see disease culminating in the death of particular trees, though with more certainty and rapidity in those parts of the series in which, as admitted by Dr Lindley, it has become hereditary, and in which, as all must acknowledge, there is a greater delicacy of constitution. From these facts and considerations, we infer that the vital forces in fruit trees are only of limited amount, and that, though in plants felicitously placed it may take a longer time to expend them, still in average circumstances they invariably give way, and evince their limitation by stagnation of growth, decay, disease, and at length death.

2. We beg the attention of our readers to the analogies supplied by the first and second heads of our analysis of the phenomena. We have seen that Nature has limited the existence of annual plants to one year, of biennial plants to two years; and that even their races can be maintained, in seed sowing, only by continued high culture. Again, we have seen that the varieties of certain tuberous and bulbous rooted florists' flowers can be preserved only from 12 to 25 years. "These are short-lived species," says Dr Lindley, "but perennial plants generally, and more particularly trees, are eternal." With respect to perennial plants generally, we have to say that they are mostly in their natural state; that they are frequently renewed from seed; and that we have seldom much interest in tracing the history of the individual plants. We discussed the alleged eternity of trees in our December number, and must excuse ourselves from fighting that battle over again. The only real difference, however, between annual or biennial plants, and shrubs or trees is, that in the latter there is woody fibre;—and is woody fibre a material out of which to construct an eternity? We have already pointed to the illusion which leads us to regard a plant, whose duration measures the quarter

or the third of ordinary human life, as short-lived, but to look on one whose existence triples or quadruples it as eternal.

3. To the same effect is the testimony borne by the more general analogy, that all known organised beings are limited in their extent in space, and are subject to decay and death. We cannot speak from personal knowledge of Zoophytes and Polypes, &c., but we understand that they are only slightly organised, and that they also are capable of dying. All considerably organised animals at least die, and all known plants incontestably die. But if all highly organised beings die everywhere and without exception, it must be from some limitation in the vital forces, or for some other reason, inherent in, and inseparable from their natural constitution. Even if the death proceeds from external causes, other than violent destruction of the centre of life, the conclusion must be the same, for in that case the original vital force is insufficient to maintain the struggle with the adverse influences, and therefore fails.

4. And it is worth while to consider the means by which trees and other perennial plants are said to be endowed with a potential, if not an actual eternity. A large word this word eternity; but yet, it seems, the means of reaching it are very simple, and completely at man's disposal—viz., grafting, budding, and other methods of propagation by division. Now, it is not denied by any one that grafting, &c., are very effective means of prolonging the existence of healthy varieties. By placing vigorous scions on fresh young roots, the tendency to decay observable in all sorts may be greatly retarded; but it is not yet proved that it can be wholly counteracted. It is a historical fact that this supposed immortalizing effect of grafting has failed in the Redstreak, Golden Pippin, &c., which, if not yet extinct, are tending in that direction. It is admitted by Dr Lindley that, by means of grafting, &c., disease in fruit trees may be made hereditary, and may become intensified. Nay, there are facts that go to prove that decay may even be precipitated by these methods of propagation. Mr Masters of Canterbury, in his interesting communications on this subject to the *Gardeners' Chronicle*, June 11, 1853, and April 4, 1857, both of which have been already quoted in this journal, mentions a famous Golden Pippin tree at Ash, near Canterbury, which has outlived all the young trees that have been propagated from it. Similar evidence is borne by Dr Lyell of Newburgh. In a letter (which he will excuse us for quoting without his special permission) he says:—

"There is a curious fact which I may mention in connection with this subject. The old trees of some of the sorts—trees a hundred or more years old—are in a healthier state than their progeny, that is, than others grafted off them. This is particularly the case with some old Craufords, Benvies, and Red Pears. There are several old—some very old—trees of these sorts, which, though set in growth, are wonderfully free from canker, and bear capital crops; but young stocks grafted do not keep in health, but get cankered and useless, while their old parent continues to live on and bear."

He adds :—

"I presume the cause of this lies in the root and branches of the old tree being equalized; but when a shoot of the old tree is put on a young stock, this equalization ceases: the shoot cannot take up and assimilate the sap with which it is furnished, and consequently gets diseased, while the old parent still holds on. I find that an old tree is speedily killed by pruning away its branches, even though a few only are removed yearly, and thus destroying the balance between the top and the root. Whereas, by pruning and cutting back a younger tree, you only increase its vigour and growth."

Dr Lyell's explanation we consider to be as well founded as it is ingenious; and it is entirely in accordance with Mr Knight's theory. His facts, beyond all question, prove that there is a progression in the constitution as well as in the age of individual trees; and that grafting is not an effectual means of realising the hypothetical immortality of varieties of fruit in actual experience.

On the whole, then, we submit that Dr Lindley's theory, in its general aspect, is of a paradoxical character, and in its more restricted application is inconsistent with historical and well-ascertained facts. Mr Knight's theory, on the other hand, as it appears to us, is accordant with the facts of horticulture, so far as these are known, and is supported by many presumptions and analogies afforded by the laws of life, and specially of vegetable life. Perhaps some of our readers may be disappointed by the line of argument which we have pursued in the close of this paper, wherein it may seem to them we have relied too much on presumptions and analogies. We should be glad to see the subject treated in a more direct and conclusive way; but we were obliged to content ourselves with the evidence which is within our reach. We have already hinted that the history of the varieties of fruit trees has been very much neglected in this country; of which a paper by Mr Saul,* in *The Florist*, for May, puts us in possession of a striking instance. The original Ribston Pippin tree died not more than twenty years ago, and yet the date of its death is not known to Mr Saul, though he lives within three miles of Ribston Hall. One might have hoped that a point of so much theoretical interest would have been accurately recorded. We beg our

* Mr Saul opposes Knight's theory and propounds one of his own. He is of opinion that disease in fruit trees is wholly owing to unsuitable stocks, unfavourable climates, and bad management. It is surely surprising that Mr Knight, in his thousands of experiments, never hit on a right stock for the Golden Pippin; and that, with all his ingenuity, he failed to discover the management it required. And it is equally surprising that, in the favourable climate of Kent, Mr Masters, a cultivator of undeniable skill, zeal, and perseverance, should have been not a whit more successful, and should have abandoned the propagation of the Golden Pippin in despair of making anything of it. We may be permitted to add, that the writers in *The Florist* seem to have read only one side in this discussion. If they will animadvert on our humble speculations, they ought, in all fairness, to read them in our own pages. They might there discover that we had never said that the Ribston Pippin "is extinct, or on the verge of annihilation," or that the trees (all the trees?) of this variety have ceased to exist in East Lothian as the original tree has disappeared at Ribston Hall.

readers to note particularly the subject which has been under discussion; it is whether the theory of Mr Knight or that of Dr Lindley affords the more satisfactory explanation of the acknowledged decay in the varieties of fruit trees. The difference between the theories was reduced to the somewhat narrow and nice question, viz., does the decay arise from inherent causes or extrinsic influences?—and in answering this question we were compelled to rely on such evidence as is readily available. We think, however, that the bearing of the evidence is strongly in favour of Mr Knight. As to the *fact* of the decay—which is all, perhaps, that some will concern themselves about—one has only to open his eyes in such a place as Newburgh, and many other localities throughout the country, to see it staring him in the face. We regret that want of space obliges us to defer a few remaining observations to another occasion.

THE GREENHOUSE VINERY.

BY MR R. ERRINGTON, OULTON PARK, TARPORLEY.

PERHAPS there is no class of persons indulging in the amenities of gardening, who more require assistance or advice than the possessors of what are called Greenhouse Vineries, which are to be found in every part of the United Kingdom, and which furnish gratification to thousands—not only as assisting the dessert table, but as a source of most agreeable recreation and interest. The culture of pot plants beneath the Vines is of course an important consideration; and as potting is a somewhat nice art, I am anxious in the following remarks to offer some sound practical advice, which I address more particularly to those amateurs who have not as yet paid sufficient attention to the subject. To have included Vines also, and the many features in their culture, would occupy too much space; I will therefore commence with the

DRAINAGE OF POT PLANTS.—As connected with plant culture, drainage is of so important a character, that the best of practice in other respects may be rendered nugatory without a due attention to it. There are many ways of accomplishing it; some are partial to the use of pounded crocks, others are for charcoal, some use all the oyster shells they can get, and others depend much on moss, turfy matter, &c. I have lately ascertained that some of those on the Continent who grow young *Camellia* stock seldom use crocks, but are content to thrust a lump of fibrous peat in the bottom of the pot. But these *Camellias* are grown for a quick sale; had the raisers to cultivate them for a dozen years or more, they would soon resort to the use of something more enduring than peat or moss. Whatever fibrous material may be used, I recommend the amateur never to pot or re-pot anything choice without putting a little of what is called imperishable material in the bottom of the pot. Broken pots pounded are excellent, so is charcoal; the latter mixed with the crocks is good

practice. Certain it is that the roots adhere fast to the charcoal, and appear to derive much nourishment from it; and having long witnessed this in a variety of cases, I seldom make a compost or drain a pot without charcoal or charred rubbish forming a portion.

Drainage, as applied to pot plants, may be thrown into two classes, viz.,—*Temporary Drainage*, and *Permanent Drainage*; the former applied to Annuals, or those soft-wooded and quick-growing plants which only remain a summer or so in their pots; the latter, to hard-wooded plants, which remain years in their pots or tubs; and indeed to all choice things, which are known to abhor the least stagnation. Temporary drainage is generally composed of a hollow crock, placed over the hole in the pot bottom, and, frequently, over that a little of the rough portions of the compost. Permanent drainage has several hollow crocks overlapping each other, in such a way as to cause many outlets for the escape of water; these are generally protected by a sprinkling of pounded crocks, which, rushing into the interstices, prevent the soil from entering and impeding the passage of moisture. On the surface of these, some fibrous turfy material is generally placed before inserting the plant; this is found to satisfy every demand, and to endure for many years. Moss is very good to throw over the drainage, but from long experience of both, I prefer turfy material, having much of the loose soil shaken out. I have drained hundreds of pots of Annuals, bedding plants, &c., within the last two years, with small lumps of charcoal, the size of horse beans; merely throwing a few on the pot without adjusting them: nothing can answer better.

POTTING, RE-POTTING, &c.—This is an operation which, with regard to choice and delicate plants, requires a little skill. I shall, therefore, examine the affair closely. Potting, or as it is commonly called, “potting off,” is the placing a single plant in a pot for the first time; there is consequently no hard ball to insert. Re-potting is the transference of a plant already established in one pot to another—generally a size or two larger. These two processes of course differ, and I will explain how and why. Everybody knows that water will not pass so readily through compact soil as through that which is loose; and as it is most desirable in watering pot plants, that the water should percolate as equally as possible through the whole body of the soil, it is evident that some little skill must be exercised in the act of potting, to cause such equalisation. But in first inserting a plant in a pot, the compost is equal, and of course the operation uniform. Hence, in potting young stock, especially soft-wooded things, the operator does little more than toss the soil around the plant, and give the pot a thump on the potting bench. Not so, however, with hard-wooded stock; here more pains are required, and the larger the shift or change, the more caution is requisite. For ordinary soft-wooded plants, annuals, &c., most cultivators use a coarse riddle,—not however as a matter of principle, but of convenience; but for hard wooded stock, such as the various

New Holland plants, *Ericas*, *Camellias*, *Azaleas*, &c., the riddle should be dispensed with, and the spade substituted. Turfy materials are the great desideratum; quality combined with durability is the object sought. In chopping turfy materials, the size of the pot or shift they are required for must be taken into consideration; for a five-inch pot, lumps of turf averaging about an inch in diameter, and for a twelve-inch pot, lumps from two to three inches, and proportionably as to intermediate size. These being chopped with a sharp spade when tolerably dry, may be tossed in a coarse riddle, to eject some of the mere soil. In re-potting, after securing the drainage as before advised, place a layer of these lumps over the drainage, and let the ball of the plant be placed upon them without any intervening body. Then, having a little compost adapted to the plant at hand, fill up, by thrusting layers of the lumps round the ball, occasionally sprinkling a thin layer of the compost; finally, let there be an inch or two of the mixed compost to finish with, pressed closely all round—this acts as a regulator of air and moisture. In all operations of this kind, the chief thing is to fill in and use pressure with equality; this it is which for years after will cause the water applied to search every cranny of the soil; for in unequal potting it runs away capriciously, swamping some portions and avoiding others. I may here observe as to the turfy lumps, that they must, of course, be composed of the materials the plant is disposed to; fibrous heath soil which adheres together, and toughish turfy loam, are the only materials requisite as lumps in general potting; such things as leaf soil, charred rubbish, manures, sand, &c., where necessary, should constitute the mixed compost which is strewed amongst the lumps.

WATERING NEWLY POTTED STOCK.—This is more important than some people imagine. One maxim should be adhered to—after watering newly potted plants, not to move them for a fortnight or so, if possible. But they should not be watered until placed where they are to remain awhile. As to the hard-wooded tribes for which the lumps were recommended, if at all “pot-bound,” they should be carefully watered a couple of days or so before re-potting; and if the ball is hard and wedged-up with fibres, the only plan is to soak them over the pot rim in water for two or three hours; in this case they must stand in some airy situation for a couple of days previous to potting, in order that excess of moisture may be in some degree parted with. In watering plants potted in fresh and dryish soil, more is needed at first than they commonly receive; dry soils contain too much air in their interstices; and this has to be displaced with water for awhile. The best way is to sprinkle them with a fine rosed pot four or five times lightly; the operation extending over a dozen hours. The whole volume of soil and drainage should be moistened, and this accomplished, lighter waterings afterwards may be used.

ADDITIONAL NOTES ON PEONIES.

IN our number for March, we sought to direct the attention of our readers to the beautiful family of Peonies, as affording abundant and exquisite ornament in the flower garden, when there is nothing comparable to them in bloom. As the period of their flowering approaches, we would gladly recal them to the recollection of those who are in the vicinity of collections, and who, therefore, may have an easy opportunity of inspecting them, and of satisfying themselves of their beauty. It is not to be doubted that they will yet, when properly appreciated, hold the place, in early summer, which is occupied by the Dahlia in autumn; though, like other summer flowers, their glory is more transient. In the bright sunny days of June, we can afford to be content with short-lived flowers.

P. albiflora. To our list of Mr Salter's prize varieties of last year, we are enabled, by the kindness of that gentleman, to add the names and brief descriptions of the following sorts, as meriting special notice.

Amabilis lilacina, cream, with lilac centre.
Comte de Paris, blush, with bright citron centre.
Duchesse d'Orleans, deep rose, and blush centre.
Formosa plena, sulphur white.
General Bertrand, rose peach.
Gloria Mundi, pale rose, and citron centre.
Grandiflora carnea plena, rosy blush, and lemon centre.
Grandiflora nivea plena, delicate lemon blush.
Lilacina superba, rose, lilac, and saffron.
Nivea plenissima, splendid blush.
Potsii plenissima, deep crimson.
Rosea plenissima superba, bright rose, and nankin centre.
Sulphurea superba, sulphur.

In a letter to us, Mr Salter, with very justifiable satisfaction, remarks:—"The beautiful varieties of this flower were almost unknown to amateurs in England, until I exhibited them two or three years since; and those who have visited my nursery in summer, have been astonished at the variety and gorgeous colours. They will soon become more known. My principal bed is about 40 feet long, by five feet wide, and contains about 50 varieties; and, as the plants are four years old, you can form some idea of the vast number of splendid flowers." Most assuredly, were we within 50 miles of London in June, we would not leave to fancy to picture the beauties which Mr S. describes, we should make a pilgrimage to Versailles Nursery, Hammersmith, and see them all with our own eyes.

P. Moutan.—Respecting this species, Mr Salter says:—"It will never, in my opinion, come into general cultivation; it is no doubt very beautiful, but the great difficulty of propagating, and keeping it, are against it; and after all, the herbaceous kinds are really of finer form, and nearly, if not quite, equal in colour." Mr S. will excuse us for quoting this observation, which was not intended for

publication ; and he will also excuse us if we do not take quite the same view as he does of the importance of the Tree-Peony. We do not undervalue his favourites—the lovely varieties of *P. albiflora* ; but we are not yet prepared to give up our first love, the Tree-Peony. We must say that we have never experienced any difficulty in keeping *P. Moutan*. We have seen it thriving in a great variety of situations and climates. In our own garden, which is 350 feet above the level of the sea, with a bleak eastern exposure, it has stood some winters without covering. Indeed we never think of sheltering it till the beginning of February. Probably in the earlier climates of the south it is apt to get spring-nipped. As we formerly remarked, the secret of growing the *Moutan* is to plant it in a good hearty soil, composed of turf with a slight admixture of peaty earth or leaf-mould, and to allow it the full advantage of the rays of the sun during its growth, and while it is maturing its flower buds. We have seen, it is true, some miserable specimens in nurseries, dwindling in light sandy soil, or in exhausted beds of peat earth, where everything seems contrived to keep plants in as small dimensions as possible. To succeed in propagating the *Moutan* by layering—the only method which we have hitherto practised—the parent plant must be kept growing vigorously. To build pits for the propagation of this Peony seems to us worse than nonsense. We suspect that Mr Fortune's new varieties met with very indifferent treatment while kept in durance vile by those who paid so many hundred pounds to get possession of them. We trust that, now they are set at liberty, they will soon spread themselves over the length and breadth of the land. It is curious, too, to remark how little the method of propagating the *Moutan* on the roots of the herbaceous sorts appears to have succeeded in Europe. Though described by Mr Sabine 30 years ago, and repeated by Loudon, Macintosh, Fortune, and others, it has probably not been attempted by half-a-dozen of persons since then ; and indeed the attempt was not likely to be successful if it was made “any time during winter,” as we are told it may be. Clearly the propitious time for this operation must be at the period when the *Moutan* begins to elongate its buds in spring ; and after the grafting, the growth should be promoted, by a moderate but genial bottom heat. The tuber of the herbaceous Peony is never intended to be a permanent root : it can only serve to supply a little sap till the scion of the arborescent plant above sends out roots of its own. We commend the experiment to those who have the proper appliances at command, assured that with intelligent treatment it will not fail to be successful. It is not very creditable to our boasted skill that John Chinaman should have beat us so hollow in this.

Persuaded then that the *Moutan* is not difficult to keep, and that it may be propagated with certainty, if not with the same facility as Roses and Dahlias are, the main obstacle being the slowness of the growth of the plant, we would pray our readers to contemplate its gorgeous beauty, and to consider whether it is not desirable to have

a large supply of this magnificent denizen of our gardens. It is to be regretted that the now numerous varieties are but little known amongst us. We formerly remarked that we could not venture to harmonise the current lists; for while we suspect that some ill-defined varieties have been dignified with names, there are many which we have not had an opportunity of studying. Surely some amateur or florist-botanist, more advantageously situated, will ere long favour us with a selection and description of the most distinct and desirable sorts. In the meantime, as a step in the right direction, and in order to convey some idea of the exuberant beauty of this species of Peony too much neglected by all and unknown to many, we give the following abridgement mostly of the descriptions of sorts by the late Mr Sabine, and we suppose by Professor Lindley, in the Transactions, and Journal of the London Horticultural Society.

1. *Paeonia moutan papaveracea*.—The type of the species. The flowers nearly single; expanding about 10 inches; white with a deep purple spot on the lower part of each petal; the edges of the petals a little jagged. The anthers are yellow, and are conspicuously interposed between the dark spot of the petals, and the deep purple cases of the germens; the stigmas appearing united at the top of it. Petioles of the foliage red. Introduced from China in 1802.—*Transactions of Lond. Hort. Soc.*, Vol. VI., p. 469.

2. *P. M. Banksii*.—The flowers usually quite double, with an expansion of eight or nine inches, sometimes so full as to be reflexed in the external parts. The petals, slightly tinged with blush, become nearly white at the edges, and are marked at the base with purplish red, this dark colour sometimes mixing with the paler parts of the petals, and passing into rays or featherings. Petioles of the foliage red. Plant variable. Introduced in 1789.—*Ibid*, p. 472.

3. *P. M. Humei*.—Nearly allied to the preceding. The peduncles thicker and longer, and the foliage and foot-stalks greener. The flowers are somewhat larger and more double; and have a bunch of long petals rising from the middle of the flower. It blooms a fortnight earlier. Introduced in 1817.—*Ibid*, p. 475.

4. *P. M. rosea semiplena*.—Flowers semi-double, cupped, not opening widely; if completely open would have an expansion of from six to eight inches. The petals are large, of a fine deep pink, very slightly darker at the base, of a very satiny appearance, crisped in the margin, and occasionally notched in the centre. The shoots in spring have a reddish hue, which passes away as they advance. The flowers in opening have a delicate rose-like scent. Introduced about 1794.—*Ibid*, p. 476.

5. *P. M. rosea plena*.—A sub-variety of the preceding, and doubtfully distinct. The flowers of the size of those of *Banksii*, of a uniform rich pink, the edges of the petals becoming paler after a time. The exterior petals are large, broad, deeply notched in the centre

with crisped margins; the interior petals numerous, long, narrow, much jagged in the edges, rising in the middle to a considerable height. Introduced in 1794.—*Ibid*, p. 477.

6. *P. M. Rawesii*.—The flower expands about 7 inches; the petals, twelve in number, pale, tinged slightly with pink, much lacinated in the edges; both the petals and the foliage resemble greatly those of a herbaceous Peony; introduced in 1820.—*Ibid*, p. 479.

7. *P. M. Carnea plena*.—Flowers like those of Banksii, but smaller and more compact; raised from seed, along with 8 and 9, at Arley Hall, the seat of the Earl of Mountnorris, about 1819.—*Ibid*, p. 481.

8. *P. M. Albida plena*.—Flowers large, pale, but not decidedly white, suffused with purple.—*Ibid*, p. 482.

9. *P. M. Anneslei*.—The blossom small, $4\frac{1}{2}$ inches in diameter, almost single, the petals slightly jagged at the margins, of a rich purplish pink, their bases being a rather darker purple. Named by Mr Sabine after Lord Mountnorris.—*Ibid*, p. 482.

10. *P. M. picta*.—Flowers about the size and appearance of rosea, but more semi-double; the petals of a rose ground colour, streaked, stained, and veined with a rich deep rose towards the edges, especially in the inside; rather jagged at the points, somewhat in the manner of a Parrot Tulip; very handsome; sent home by Mr Fortune from China, and received in 1844.—*Lond. Hort. Soc. Journal*, Vol. II., p. 308.

11. *P. M. atropurpurea*.—Flowers nearly single, with a few small petals in the centre; the petals, 6 to 8 in number, deep purple when full blown, with a decided lilac tint when younger; the foliage deep green, with little red, the plant vigorous, a distinct and desirable variety; sent, along with the following, from China, by Mr Fortune, in 1846.—*Lond. Hort. Soc. Journal*, Vol. III., p. 236.

12. *P. M. Salmonea*.—A good double flesh-coloured variety, much resembling *P. officinalis* var. *canescens* in the flowers; the outer petals, when fully blown, are of a pale salmon colour, the inner have a deep rich tint of the same; the leaves are pale green, with little red about them.—*Ibid*.

13. *P. M. Parviflora*.—The flowers resemble those of rosea, but are much smaller, and are of a pale rose colour; they are of a good double, the centre being filled up with small narrow petals; the plant resembles rosea in foliage but is hardier; sent with the following by Mr Fortune from Shanghai in 1845.—*Ibid*.

14. *P. M. globosa*.—This is a fine, large, round white kind, with the base of the petals stained with round blotches of deep purple; the flowers are perfectly double, but otherwise those of *P. M. papaveracea*. This is one of the finest of the Moutans.—*Ibid*.

15. *P. M. lilacina*.—It resembles Banksii in the form of the flowers and foliage, but the flowers are more double, and shaded with deeper lilac or purple. They are well filled up in the centre with

small petals, which are deeper in colour than the outer ones. A fine variety.—*Ibid*, p. 237.

16. *P. M. versicolor*.—Flowers large, semi-double, or probably quite double, with large broad petals very irregularly arranged, and cut on the edges, deep purple near the base, fading into a rosy lilac near the outside. Foliage like that of papaveracea; a very handsome and distinct variety. Introduced with the following by Mr Fortune from China in 1846.—*Lond. Hort. Soc. Journal*, Vol. IV., p. 224.

17. *P. M. atrosanguinea*.—Flowers a good double, dark crimson, outer petals large and mostly entire, inner ones much smaller and lobed; foliage like papaveracea, but rather narrow and more pointed. Very handsome, the darkest in colour of all the Tree-Peonies yet in cultivation.—*Ibid*, p. 225.

In English catalogues may be found the following additional names:—*P. M. variegata*, *lacera*, *punicea*, *speciosa*, *Arleyi*, *pumila*, *rosa gallica*, *Victoria*, &c. And in French catalogues:—*P. M. alba lilacina* (large and fine), *Madame de Vatry* (very large), *Athlète*, *Comte de Rambateau*, *Eliarsii*, *Elisabetta*, *la Ville de St Denis*, *Lambertina*, *Regina Belgica*, *Triomphe de Malines*, &c. We doubt not that the skilful growers, in the fine climates of the Continent, will yet make numerous additions to these lists. We hope to give some account of them at another time.

S.

CULTIVATION OF THE POINSETTIA PULCHERRIMA LESCHENAULTIA FORMOSA, &c.

THE following query has been received from a correspondent in Suffolk:—

Being much indebted to the *Scottish Gardener* for much useful information, I venture to make the following inquiries, hoping you may kindly afford me the instruction I wish for, in one of your forthcoming magazines.

What is the proper treatment for—

Poinsettia pulcherrima.
Pleroma elegans.

Leschenaultia formosa.
Boronia serrulata.

My plants have been injured, if not spoilt, by the gardener keeping them in the stove instead of greenhouse, and I wish to know how best to manage some young cuttings which have struck root (not *Poinsettia*) at a time when the cold and damp weather of autumn sets in?

[*Poinsettia pulcherrima* should be struck from well ripened eyes (in the same way as Vines) or from short-jointed wood, in the early part of February, and shifted on when rooted well in each pot, say into 8-inch pots for blooming the first year. They should always

have a stove temperature, and a slight degree of bottom heat till in bloom. Stop them once or twice, in order to get dwarf and bushy plants. When done flowering, the wood should be well ripened by partially drying them off; then rest them for a little while, and cut them down to two or three eyes, and when they break again a few inches long, partially shake them out, and pot in same sized pot in a mixture of equal parts, loam, peat and leaf mould, with a sprinkling of silver sand. When well rooted, shift into larger pots, and grow them near the glass in a moist and brisk temperature, and you will not fail to have fine plants.

Leschenaultia formosa and *Boronia serrulata*, in order to be brought through the trials of autumn and winter, should be induced to make an early growth in an intermediate house or pit, near the glass, and then gradually hardened off, to stand for a short time full exposure to the sun and air, so as to well ripen their wood—at all times being secured from rains. This, with thorough drainage and an open soil, will enable them to brave the trying season in a dry corner of the greenhouse near the glass, and not exposed to cutting currents of air.

Pleroma elegans should be managed in a similar manner to the last two mentioned plants, only it requires a little more heat while making its growth; a light airy part of the stove near the glass suits it well. For soil choose peat, leaf mould, and a little loam and sand; pinch the shoots back, occasionally up till July, and then in order to get it into a blooming state, let it have plenty of light and air with less atmospheric moisture, and it will, if so treated, winter well in an intermediate house, or even a greenhouse, and bloom well.

All these plants are first-rate things, and not at all difficult of cultivation, and we hope articles will appear in our pages treating of their culture more at length.]

THE BEST WAY OF GROWING HOYA CARNOSA AND H. CUNINGHAMII.

It may be thought to be presumptuous in me for putting the word "best" in the heading of this article. There are many ways of managing them and all other kinds of plants, but it must be admitted that the way by which the plant or blooms are shown to the greatest advantage must be the best.

Individuals generally get into a particular way of managing any given plant, and then suppose that that is about the only way in which it can be done, and, consequently, never give it a thought whether there is room for improvement or no. These plants are well known to all; therefore description is needless. It will be sufficient to say that they are climbers, or perhaps better still, to say twiners; therefore most people grow them upon and around a

trellis of wire of some shape which suits their taste ; others, around stakes thrust into the soil round the edges of the pot ; and not unfrequently do we see them standing at the foot of a wall or partition, or planted out in a bed of prepared soil to be trained over the whole face of the wall or partition as the case may be. Now, I venture to say that in any of these positions they do not, they cannot, show themselves as they might be made to do. All flowers do not show themselves alike. Some are seen best from above, others when on a level with the eye, and others are seen best from below. Such things as *Cinerarias* and *Tulips* belong to the first section, *Calceolarias* and *Gloxineas* to the second, while *Fuchsias* and *Hoyas* belong to the last. Those who have seen a well-bloomed *Hoya* over head, will never be satisfied with a side view of the plant on a wall where leaves and flowers are mixed together, and neither the one nor the other is seen to advantage.

The following is the way that I would recommend them to be grown. Having a young plant at hand, either purchased or home struck, for the *Hoya* is one of the most easy plants to propagate of all that we gardeners have to do with, if a cutting be placed in sand, or sand and peat, and placed in a little bottom heat, there need be no fears entertained about the striking ; and when potted off in small pots and shifted occasionally, they soon make nice plants. The plants, then, being ready, get a pot, say about one foot diameter ; clean it well, if it has been used before ; put plenty of drainage, for there must be nothing like stagnation about the roots, or all will be a failure. Then fill with the following compost, loam two parts, peat two parts, leaf-mould one part, sand one part. If the loam is broken up with the hand and left in pieces as large as the egg of a hen, it will be all the better for the plant. Fill moderately solid, and place the young plant in the centre or at the side, according to the place that the pot is intended to occupy, and then place it at one end of any house where the temperature ranges above an ordinary greenhouse. Let the pot stand on a shelf or stage, or any other such place, but close to a walk, over which the shoot or shoots should be trained. Now, if there is no convenience for training them in this way, get a long piece of wire—copper is best—and strain it from one end of the walk to the other, once, twice, or thrice, according to your own fancy ; then along these wires carefully train the shoots of your growing plant, though they will not require much attention, for they will twine round the wire and but seldom require touching by any one. That is for *H. carnosa* ; now serve *Hoya Cuninghamii* in just the same way, only put it at the other end of the house or walk, and train it along the same wires to meet the *H. carnosa* ; when they do so, allow them to pass, and pursue their way to the end of the wire, then the shoots can be turned back and made to go the length of the wire again, which it may do several times over. The reason why they should be mixed is because one, namely *Carnosa*, flowers in spring and summer, and the other, *Cuninghamii*, flowers in the

autumn. In this position they can be seen to the greatest advantage by all who pass through the house, and they will be as much, or more admired, than all the rest of the inmates of that structure.

T. J., Manchester.

NOTICE OF STOCKWOOD PARK GARDENS.

(From a Correspondent.)

STOCKWOOD Park, the Seat of W. Crawley, Esq., has lately been brought very much into notice from the fact that it is from it that the Golden Hamburgh Grape has emanated, which is this month to be distributed to the gardening world, by Mr Veitch of London. Stockwood is situated about 30 miles north from London, and about 1 mile from the flourishing town of Luton, in Bedfordshire. We lately had the pleasure of inspecting the Gardens here, and, in so doing, were very much gratified with all we saw, and, perhaps, most of all with the Golden Hamburgh Grape, which we found in the first hothouse we entered, giving every promise of maintaining the high encomium which has already been bestowed upon it by very competent authorities. "Vitis," who, some time ago, in the *Gardeners' Chronicle*, expressed his fears that this Grape was degenerating, may rest assured that such is not the case, for, in the Vinery in question, we saw it—the first week in May—showing abundance of fruit, and some of the bunches which were then not in flower, measured nearly 1 foot in length. In the same house are a number of Black Hamburgh Vines just about the same stage, and for vigour, and a fine show of very large and compact bunches, we never remember to have seen their equal. On making enquiries as to the character of the border and other matters which might be supposed to have to do with so vigorous a growth, and plentiful a crop in the case of both the kinds of Grape mentioned, we were informed by Mr Busby that there was nothing particular in the consistency of the border, it being neither very large nor very rich, but he attributed the good condition of the Vines to the fact that every care was taken to preserve the young roots made in summer and autumn from perishing in winter, and to this end every drop of rain was carefully thrown off the border in autumn and winter, by means of covering it with glass. In another Vinery we noticed a famous crop of Hamburgs just colouring, and also Royal Muscadines and Muscats of Alexandria, equally good.

In the early Peach house where a good crop was then stoning were some very peculiar and distinct looking seedling Vines. The foliage of some of these is much more deeply cut than any we ever saw before. They might be described as "fingered or digitate" leaves, and the footstalks of the leaves on one of the Vines was densely set with strong hairs.

Mr Busby is celebrated as a cultivator of Roses in pots, and here we found two small span-roofed houses occupied with fine specimens of these, chiefly hybrid perpetuals, which will no doubt appear at the Metropolitan forthcoming shows. They were plunged to the rim of the pots in a gentle bottom heat. Amongst these were magnificent specimens of Chenedole, Baronne Prevost, William Jesse, Paul Perras, Geant des Batailles, and many other popular show sorts all on their own roots, and mostly measuring from four to five feet in height, and from three to four in diameter. Mr Busby prefers them on their own bottoms to budded ones, and finds that they are not so likely to get bare at the bottoms of the plants from the fact that when on their own roots they throw up strong shoots from time to time, which when cut back, gives young spray to fill up the specimens. We need scarcely say that Mr B.'s plants give every promise of being very fine, and covered with bloom.

A span-roofed show house was exceedingly gay with Azaleas, Boronias, *Salvia gesnerifolia*, Cinerarias, Geraniums, and Roses, and intermixed with these were beautiful plants of Golden Chain Geranium, which was very effective. Among the Roses was most conspicuous "Jules Margottin," a bright carmine, with blooms of an immense size.

A span-roofed stove was very gay with Orchids and stove plants, very tastefully intermixed with Ferns, which takes off the stiffness so peculiar to a structure wholly occupied with Orchids.

Pits and frames were occupied with Pines, Melons, Cucumbers, and numbers of bedding-out plants hardening off. Mr Busby makes use of the Golden Chain and other variegated Geraniums extensively, for edgings. Among the more common style of Scarlet Geraniums, we notice "Trentham Rose," a variety used at Trentham, —where it was raised— for ribboning, for which it must be very effective. The truss and petals are very large, and of rather a cereus than a rose colour. In habit, the plant is dwarf and compact, and from what we could see of it there, it is altogether a first-rate parterre plant.

The flower garden, which is plain but neat, was in admirable order, as also was the kitchen garden, where a quantity of dwarf standard Pears or Quince stocks are grown in borders on each side of the intersecting walks. Most noticeable perhaps, in this department, was an espalier tree of the "annual souring" Apple, which measures from tip to tip 75 feet, is in the most vigorous health, seldom failing of a crop, and is a famous baking Apple. The Peaches on the walls were protected with a projecting coping, which Mr B. finds sufficient without any further covering.

We were told that here the "Stanwick Nectarine" does well, never cracks, is juicy, and well-flavoured, coming in just as the more popular sorts are over.

A Cherry wall planted in 1855 was particularly beautiful, being one sheet of blossom, and the trees famous health.

OPEN GUTTERS IN FORCING HOUSES.

In the number of the *Scottish Gardener* for March, we observe a communication relative to moisture for forcing houses, which, according to Mr Thomson, is the only plan which is unobjectionable, and completely answers the end in view.

Now, we must confess that we are at a loss to see wherein consists this superiority; on the contrary, it appears to us to have some serious objections, which we shall briefly state, and if in error, shall be happy to see corrected.

There is nothing new in having open gutters; it is simply a modification of the open tank system of heating. It is also described by M'Intosh in his *Book of the Garden*, vol. I., p. 186. It is not applicable in all situations where moisture is required; for instance, how can it be applied to a range of houses which are all heated from one boiler, where, as is often the case, they may be on an incline; or where there are a number of forcing pits, stoves, or such like, the pipes of which are generally required to be placed on different levels.

In the communication referred to, it is stated that "one thing must be especially attended to, and that is, that the supply cistern of the boiler must have the water kept in it to the exact level of the gutter;" and this nice adjustment is proposed to be done by placing a ball-cock in the cistern; would not an overflow be required also? Every person knows that water expands with heat, and the more piping that is on an apparatus, the larger the quantity of water contained in it, and consequently a very great expansion. Now, as we take it, the legitimate use of a cistern is to receive the expanded water, and thereby prevent a needless waste. But if open gutters are adopted, there would be very little use for a cistern at all, anything that would float the ball of the cock would be sufficient, for when the temperature of the water is raised, the expanded water must be allowed to run to waste, otherwise it will run over the sides of the open gutters, and when the water cools, there will be a deficiency of water equal to that which has run off; then the ball-cock is to open and supply this waste, but a ball-cock which would require so much working, especially in warm water, would soon become useless.

Such an arrangement might possibly do if nursed, but generally, gardeners have plenty to attend to without wasting time watching the fluctuations of the water in a cistern. Another objection is, all natural waters hold various solid matters either in solution or suspension; the constant overflowing and *evaporation* of the water, contained in an apparatus with these open gutters, must cause a very large quantity of water to pass through the pipes, and thereby deposit a very considerable amount of sediment, which in the course of two or three years will choke up the pipes and boiler, and render

the apparatus useless. This is well illustrated in steam boilers, where the water being converted into vapour, all the sediment is deposited at the bottom, and requires to be regularly cleaned out, but from the large dimensions of the boilers, this is an easy process.

This choking process will be accelerated by leaves or other matters falling into the open gutters, and as the water is in constant circulation, being immediately carried into the main pipes through the connecting pipes.

Now in all houses where plants are, leaves are always dropping off, and in forcing houses or pits, where they would be required for bottom heat and moisture, they would become receptacles for all matters that might fall from the bed above them.

Seeing so many objections to these open gutters, and knowing that the simpler all arrangements in horticultural buildings are the better, we are still of opinion that the fixed or cast troughs on the pipes are the most efficient and simplest form by which vapour can be supplied in any arrangement, and as to the trouble of filling them with water, why, plants require watering every day, and when the gardener is thus engaged, the gutters can be filled at the same time.

But even with these, there is room for improvement—a small water pipe from some cistern could be carried parallel with the heating pipes, and branches from it into each of the fixed troughs, and by having a cock in some convenient position, water could be supplied without any trouble.

DAISY.

THE BENEFICIAL EFFECTS OF DEEP TRENCHING.

BY MR R. ERRINGTON, OULTON PARK, TARPORLEY.

EVERYBODY talks about deep trenching, yet how few practise it. Is it that they are not assured of its great benefits, or that they cannot find time? If the latter, it is a grave reflection on the policy of those who fix the labour standard. When we take into consideration the deteriorating effects which must take place in the soils of our kitchen gardens, through cultural processes constantly going on during a long series of years, it appears a marvel that they should continue so productive as they really are to our ordinary crops; but the consumption of manures is enormous, as compared with ordinary husbandry. The crops are consequently obtained at a high cost. These soils very generally acquire with age an effete and powdery looking character; in ordinary parlance, "worn-out." But the question arises—What alteration has taken place in the soil? Is something abstracted, or too much added—or both? The question here assumes a chemical character, and in such shape has frequently perplexed the learned; but, I believe, the most general impression

is, that it is owing principally to the abstraction of certain inorganic matters, and the substitution of an inordinate amount of humus in its stead. That inorganic matters are imparted to the soil through the application of organic manure there is little doubt, but surely in such small amount as to be entitled to small consideration.

Now, it so happens, that a renovating principle lies in the subsoil in many cases, at least so I have found it in practice. I will not go so far as to assert that every kind of subsoil may be brought to the surface with benefit, or even with impunity; but I think it very probable that it generally may be done. It is necessary here to observe, that to trench merely the old soil, and to trench—designedly bringing up some subsoil—are separate affairs. The latter is the practice I have to advocate, as by it I have derived vast benefit. I must here confess, that some years since I had a prejudice against this practice, as will be manifest by what I am about to relate. Having been frequently baffled in attempting to grow the Silver-skinned Onion small and delicate; as also Red Beet for salad purposes, the latter generally too gross from the ordinary soil, I thought I would try the effects of the subsoil, and accordingly I had a plot trenched three spades in depth, bringing nearly a foot of the subsoil to the surface. The soil itself is what may be termed a sandy loam, darkened by long culture, and the accumulation of humus through frequent manurings. The subsoil is a slightly adhesive red sand, having an argillaceous tendency. This plot of ground was selected as being the poorest in the garden, and I had concluded that it would be, in ordinary terms, poverty-struck after the operation. Well, the plot was sown with the Beet and the Silver-skinned Onion, the latter in raised beds one foot above the level, and the picklers turned out the largest Onions in the garden, the Beet exceeding all for grossness. This disappointment, although a loss as to the character of the articles, was indeed a great gain, for it taught me a lesson which has influenced my practice ever since.

I have made a point in later years of trenching one-third of the gardens every year, and of bringing up some five or six inches of the subsoil at every operation, taking care to drive strong hobs down to each plot, on which is superscribed the date and character of the operation, with the condition of the soil, &c. Since that period, Onions, which were the most precarious crop we had to encounter, have been eminently successful; and the “club” in the Cabbage worts, which had become so virulent that it seemed almost in vain to plant Broccolis, has nearly vanished, and is amongst the best of our crops. With regard to the latter I may observe, that I also use charred mixture in the holes to receive the Broccoli plant; so the burning and trenching here divide the honours between them.

It may be observed, too, that deep trenching is a cleansing process. The weeds, if not extirpated, are kept much in subjection. For all crops that are liable to fail in old and effete soils, this prac-

tice may be strongly recommended ; and for one case of deterioration—if such should prove the case—there will be a score of improvement.

Persons possessing gardens, and desirous of high culture, should know that these practices involve a little extra labour ; but if well-directed labour will not pay, and prove satisfactory, shall we say that neglect will ? These are not the times for supineness ; advance both can and will be made, lag who will in the rear. The Scotch have a saying that “ a gude tale is nane the waur for being twice told,” and so with deep digging. Although I claim not the merit of the invention, I may at least draw attention to the subject.

HEATING OF HORTICULTURAL BUILDINGS.

BY MR J. ANDERSON, GARDENER, MEADOW BANK, UDDINGSTONE.

I am induced to offer a few observations on this subject which has so much engrossed the attention of the gardening world for a considerable time, and which has also occupied not a few of your columns, more especially during the preceding part of this year.

It would be, I had almost said, ridiculous to assert, that heat produced by smoke-flues was superior, or even anything like equal to heat produced by hot water pipes. Few practical men who have both systems at work would be fool-hardy enough to pronounce in favour of the former ; but there are some gardeners who unfortunately, and I use the word advisedly, never had hot water in their respective erections, that think that nothing can be equal to the “ old flues.” We will be generous enough to suppose if such men had only a twelvemonths' trial of hot water, they would probably reconsider their verdict.

But I have always thought, in a house where very little fire heat was required unless the keeping out of frost, that a flue might serve the end, being so much cheaper in erection, and in that particular case, requiring little or no outlay for a number of years ; until Mr Thompson, of Dalkeith, first in your January, and then in your April number of present volume tells us, that a house 75 feet long by 10 feet wide can be heated for £15. This is certainly on a scale unprecedentedly low, and if Mr T. can guarantee a first-rate job at that sum, there cannot be a doubt but such is a step in the right direction ; for heating now on scientific and economical principles, is one of those obstacles to a more rapid progression of getting up horticultural erections, which glass half a century ago from the then imposition of a heavy duty.

But Mr Shearer of Yester raises the question of comparison in the prices of the flue and hot water principles, and I willingly give an estimate for a house the same dimensions as Mr T.'s, viz., 75

feet by 10 feet; and for the sake of accuracy, I will give a description of the flue with the several items in connection with it. The soles to be 30 inches long, 15 inches wide, and $4\frac{1}{2}$ inches thick, droved on one side and neatly jointed; to be raised off the ground level by means of brick pillars 14 inches by 9 inches. The pillars built so as the soles rest on them at the several joints. The sides to have two course of fire bricks each. Fire clay covers, 14 inches wide for the top; making the interior of the flue 9 inches by 7 inches thick for said building.

That part above furnace to be arched, a 15-inch wall of fire brick to be built above furnace, 6 feet long and 3 feet broad, two coping stones $4\frac{1}{2}$ inches thick for said building.

There is then 150 feet of flue, at 2s 8d per foot, which brings exactly £20; the furnace and bars £2; the extra building and dimensions of furnace, £2, 10s—in all, £24, 10s. This brings us to something the same end, by different means, as Mr Thompson's, being exactly £9, 10s higher than his estimate for hot-water pipes, &c. But to make the apparatus complete, there is a chimney stalk, we shall say 12 feet high by 20 inches square, with base a little wider, say 24 inches, and projecting coping, which would cost £2, 10s more; and a stock-hole, 8 feet by 6 feet, by 4 feet, would cost about as much as the stalk, allowing a 6-inch droved coping round—making a total of as near as possible £30. Now, this is but a very plain affair, after all, and at the minimum rate of our neighbourhood.

But when we compare the prices paid for our houses heated with hot water and Mr T.'s estimate, we are more than astonished; for, instead of £15 for a 75 feet house, we have been in the habit of paying twice that sum for houses of the same description. We certainly could depend on first-rate material and first-rate workmanship; but we cannot shut our eyes to the dissimilarity. Before we conclude our paper, we would venture to agitate the question a little arther, as to the best form of boiler for practical utility and durability.

It is a well-known fact, at least it ought to be so, that radiant heat acting on a surface is three times stronger than the flame after it has radiated its power on that surface. Now, what construction of boiler will the flame radiate most powerfully upon, with a given quantity of fuel? It is certain that a concave surface contracts the flame, so as to diverge over its whole surface; whereas the flame, acting on the convex surface, is more apt to heat the certain angle of the surface which the flame strikes: having, in my opinion, less power of radiation than its formidable opponent. We have the saddle boiler as a good instance of the concave surface—we have Mr Thompson's retort as one of the instances of the convex surface; but as we have little or no circulation in the pipes till the water boils in the boiler, so do we require that the construction of boiler should not have more than four or five inches depth of water, in order to secure

rapid circulation : and if a few pounds more were laid out at first for an extra row of pipes, it would not only be very much better for the houses themselves, but would re-pay itself in the saving of fuel in a very short time.

HOT WATER CIRCULATION.

THE article under this heading in the May number of the *Scottish Gardener*, from the pen of Mr Shearer, contains a paragraph that is so thoroughly opposed to my experience of such matters, as well as to the advice I have given to others, that I feel bound to reply to it, especially as it proceeds from one who has brought an acute mind to a more minute investigation of the subject than any other person I know of, and for which he is entitled to the thanks of the horticultural part of the community at least.

The paragraph I refer to runs thus :—"It sometimes occurs that a boiler requires to be placed at the end of the houses to be heated ; in these cases, there is the flow pipe on the top, and the return united at *one* side of the boiler, now both sides of the boiler should be united by returns, or there will be a defect in the efficiency of the apparatus." It is true that Mr S. adds, "the reason of this I am not able fully to explain, &c.;" but in a subsequent paragraph he brings forward the experience and practice of "one of the greatest and most successful heaters of horticultural buildings of the present day" in support of what he advances. It would appear that this party was once consulted about a heating apparatus that would not act satisfactorily, and where there was but one return to the boiler ; "he could detect no fault until the boiler was exposed, where he found it not connected at both sides." He took it out, "had it pieced and connected at both sides, when it gave entire satisfaction, and in all subsequent arrangements he adopted the same plan." Previous to this circumstance he was not aware that connection to one side only was detrimental to the efficiency of such an apparatus. "It was the only reason he could assign although he had his doubts." And well he might have, for surely during his great experience he must have met with many boilers acting well, with but one side connected to the return, and all other things being right, the one in question ought to have done the same. The fact must have been that there was a defect in the levels, or the placing of the boiler, and the taking of it out and refitting, led, accidentally, to the removal of the defect, which lay somewhere else than in the "only reason he could assign," consequently all the expense in that case and all subsequent similar cases, incurred either to avoid or remedy this supposed defect, has been so much money thrown away. In proof of this, let me say that 18 months ago I fixed a new boiler here to heat a range of glass, and I find that there are 1300 feet of piping, containing about 500 gallons of water, every drop of which

returns to one side of the boiler, and from the time the fire is set agoing all this water passes through the boiler in 40 minutes, or at the rate of more than 12 gallons per minute, and nothing can act with greater certainty and efficiency than this boiler does, and the levels are by no means those most approved of by Mr Shearer.

I can point to many similar instances, but, all other things being equal, I consider one case in a thing of this sort conclusive.

Referring to what Mr S. says of my allowing nothing for tradesmen who make a living by erecting hot water apparatus, when I advise that gardeners should make themselves acquainted with the matter, let me reply, that what I referred to was a very simple erection, requiring little or no engineering skill; but of course any material alteration or erection must necessarily be carried out by a tradesman; and the estimates I have given in my articles on Horticultural erections have been uniformly furnished by tradesmen, and consequently include a tradesman's reasonable profit. But Mr Shearer himself supplies an unanswerable argument for gardeners acquiring a certain amount of information on this subject, and applying it too, when he says, "The job is generally bungled by the party who has the courage to say he is capable." Let me assure Mr S. that I have no desire to interfere with the legitimate calling of any man, or the just profits of such. My desire in what I have written on this subject on previous occasions was to give such "hints to amateurs" as would induce them to use hot water as being by far the most efficient, and for them—what is equally important—much more easily managed system of heating.

Before concluding, let me say that Mr S. is unjust in the remark which he makes, that "clumsy gas pipes" are what the tradesmen in the neighbourhood of Edinburgh put up. I speak from extensive experience and observation when I say that I never saw neater or better pipes than those constantly supplied by Mr Meiklejohn of Dalkeith, and I have no doubt the same may be said of other founders about Edinburgh. I think it invidious to name tradesmen in this way, but the case seems to justify my doing so.

WM. THOMSON, Dalkeith Park Gardens.

EXHIBITION IN THE ROYAL BOTANIC GARDENS REGENT'S PARK, LONDON.

(From a Correspondent.)

THE first of the great metropolitan exhibitions of plants for the present season was held in these gardens on May 20th. The weather was everything that could be desired by the most fastidious "sight" and pleasure seeker. The morning part of the day was rather hazy, with a smart breeze from the south-west; towards

noon the clouds cleared away, and the sun broke forth with that mellow radiance so peculiar to a May afternoon, and there was nothing beyond a few scudding clouds to mar the enjoyment of the (we should guess) not less than 10,000 visitors who thronged the exhibition ground, and the other parts of the delightful gardens.

As an exhibition it may, without any hesitation, be said to have been very successful, considering the severity of the weather which prevailed during the end of April and beginning of May; and, although stove and greenhouse plants have been exhibited in equally fine condition and greater in size on former years, we never remember to have seen the ground so well filled with what might, with very few exceptions, be termed good specimens of horticultural skill. We certainly missed the immense specimens of Azaleas which the Messrs Fraser of Lea Bridge, and Mr Lane of Berkhamstead used to bring out some few years ago; and all the collections of Azaleas were somewhat defective as compared with what have been exhibited on the same spot before. But then, who ever saw such magnificent pot Roses as were exhibited on this occasion by Messrs Lane and Frances, among nurserymen; and Messrs Terry, of Panshanger, and Busby, of Stockwood Park, among gardeners? These were truly grand, and were justly considered the greatest and most complete examples of good cultivation that were produced on this occasion, more especially when we come to consider how difficult it is to get a collection of Roses in such trim on a given day, and during such weather as has lately prevailed. Heaths, too, were an improvement on last year, especially the collections of Mr Williams, gardener to Miss Trail, Bromley, and of Mr Peed, gardener to F. Tredwell, Esq., of Norwood; and, generally speaking, Pelargoniums were equal to any show in May on former occasions, and Mr Turner, though still successful, was very hard pressed by Mr Dobson and the Messrs Fraser, all of whom had very fine collections.

Of sixteen stove and greenhouse plants there were five collections. Mr Whithead, gardener to H. Colyer, Esq., of Dartford, was placed first. This collection comprised some very superb plants, among which were an immense *Erica Cavendishii*, a very healthy and well flowered plant of *Ixora javanica* and *I. coccinea*, *Azalea variegata*, *A. optima*, a huge *Epacris miniata*, *Pimelea spectabilis*, *Gompholobium polymorphum splendens*, *Boronia Drummondii*, *Aphelexis macrantha purpurea*, and *Acrophyllum venosum*.

The collection of Mr Green, gardener to Lady Antrobus of Cheam, made a good second, and conspicuous in it were a fine bush of the beautiful *Tetratheca ericaefolia*, *Erica tricolor Wilsonii*, *E. depressa*, *Chorezema Lawrenceanum*, *Azalea semi-duplex mercurata*.

Mr Taylor, gardener to J. Coster, Esq., Streatham, was third, and had good specimens of *Erica elegans*, *Ixora crocata*, *Eriostemon*

scabrum, *Boronia serrulata*, *Azalea triumphans*, *Aphelaxis macrantha rosea*.

Mr Hamp, gardener to J. Thom, Esq., South Lambeth, and Mr George, gardener to J. Nicholson, Esq., Stamford Hill, were the other exhibitors in this class.

There were six collections of ten stove and greenhouse plants. Mr Barter, gardener to A. Basset, Esq., Stamford Hill, was first, who had very superb plants of *Azalea coronata*, *A. carminata*, *Pimelea Hendersonii*, *P. spectabilis*, *Franciscea confertifolia*, *Chorezema varium elegans*, and *C. Lawrenceanum*.

Mr Dods, gardener to Sir J. Cathcart, was placed second. Most prominent in his collection were well done plants of *Eriostemon myoporoides*, *Erica Cavendishii*, *Pimelea spectabilis*, *Epacris miniata*, *Boronia pinnata*, and Double red *Azalea*.

Mr Tredwell was also awarded a second prize in this class, with very fine examples of *Leschenaultia formosa*, a very fine *Pimelea spectabilis*, *Allamanda grandiflora*, and *Tetratheca ericifolia*.

Mr Carson, gardener to W. Farmer, Esq., Nonsuch, plant was third, and Mr Baxendale, gardener to W. H. Smallpeace, Surrey, fourth.

There were also a number of collections of six stove and greenhouse plants. Mr Rhodes, gardener to S. Philpot of Stamford Hill, was awarded the first prize for very fine plants of *Chorozema Henchmanni*, *Tetratheca ericifolia*, *Dracophyllum gracile*, *Eric Albertus*, *Hovea Celsi*, and *Pimelea spectabilis*.

Mr Williams, gardener to Miss Traill, was second; Mr Peed, gardener to T. Gabriel, Esq., third; and Mr Morris, fourth.

In the amateurs' class for 8 greenhouse *Azaleas*, Mr Peed, gardener to F. Tredwell, was 1st, with well bloomed plants of *Iveryana*, *Duke of Devonshire*, *Delecta*, *Jenkinsii superba*, *Coronata magnifica*, *Triumphans*, and *Glory of Sunning Hill*. Mrs Taylor of Streatham was 2d with a union plant of *Latentia* and *Gladstonessi optima*, *arborea conspicua symmetry*, *Extranea*, and others comprised in the first collection. Mr Clark of Hoddesdon was 3d, having different from the two former *Aurora Murryana* and *Prestantissima*. Mr Grix was 4th, having still different from the others *Double Red* and *Falconerii*. In the open class of 6 *Azaleas* there were 6 competitors, the first prize being awarded to Mr Turner, nurseryman, Slough, with well flowered specimens of *Murryana*, *Beauty of Sunning Hill*, *Minerva*, *Optima variegata*, *Arborea purpurea*. Mr Bray of the Regent's Park was second with six very handsome standards of *Exquisita*, *Napoleon*, *Prince Albert*, *Purpurea superba*, and *Sidonia*. Third and fourth prizes were awarded to Messrs Ivery & Son of Dorking, and Mr Morris of Bromley, in the order in which we have named them.

For nurserymen's collections of ten, Mr Clark of Streatham, Mr Cutbush of Barnet, the Messrs Frasers, and Mr Gaines were

awarded in the order they are named. Mr Clark had good examples of *Exquisita*, *Formosa*, and *Iveryana*. Mr Cutbush had a huge plant of *Prestantissima*. There was nothing remarkable in the collection of the Messrs Fraser, and that of Mr Gaines was too far gone in some cases, and in others not sufficiently forward.

In nurserymen's class of twelve stove and greenhouse plants, none of the collections were considered sufficiently good to deserve a first prize. Mr Cutbush was awarded a second prize for a very fair collection. The Messrs Fraser were placed third, with a collection certainly vastly inferior to some exhibited years ago by the same growers.

For ten Roses—Nurserymen's class—Mr Lane had the most superbly bloomed and largest plants perhaps ever before shown; they consisted of *Comte Molé*, *Queen*, *Chenédole*, *Paul Perras*, *Duchess of Sutherland*, *Coupe d'Hébé*, *Lamarque*, *Baron Prevost*, and one or two more popular sorts. Mr Francis had different from these *Souvenir d'un Ami*, *nephetus*, *Souvenir de la Malmaison*, *Géant des Batailles*, and *Auberon*. In the amateurs' class of six plants there were three collections, from Messrs Terry, Busby, and Rowland, who were successful as we have named them. These were all magnificent plants, some of them measuring 5 feet by 4 feet.

8 Cape Heaths were exhibited in good condition by Mr Williams, gardener to Miss Trail, Bromley. Amongst them we noticed *Tortulaflora*, *Perspicua nana*, *Florida*, and *Ventricosa coccinea minor*, all very fine. Mr Peed, gardener to T. Tredwell, and Mr Peed, gardener to T. Gabriel, had also very fair collections of these.

In nurserymen's class of 10 sorts, Mr Cutbush of Barnet was first, with very fine plants of *Hartnelli*, *Intermedia*, *vestita rosea*, *M'Nabiana*, *elegans*, and several other good sorts. Mr Glendinning had 10 small and rather inferior plants, including *Spenceriana*, which does not seem to be a very effective variety, the colour being so very dull.

For amateurs' collections of six sorts, Mr Taylor, of Streatham; Mr Harloch, Essex, Mr Whithead, Mr Morris, and Mr Green were successful exhibitors.

Collections of 20 Orchids were contributed by Mr Gedney in very fair condition. It included *Cattleya Skinnerii*, *Dendrobium densiflorum*, *Vanda tricolor*, *V. insignis*, *Phalænopsis grandiflora*, *Phais Wallichii*, *Calanthe ventrifolia*. This collection was placed first, and Mr Carson was second, and had the pretty *Vanda terres*, *Aeridis album*, *Miltonia stellatum*, and the peculiar *Dendrobium speciosum*. Mr Wooly was third, and had the distinct *Dendrobium Paxtonii*, *Vanda tricolor*, and *V. insignis*.

Nurserymen's collections of 16 Orchids were contributed by Messrs Jackson, of Kingston, and Parker, of Holloway, and three collections of 12 sorts were exhibited by Mr Clark of Hoddesdon, Mr Keel, Woolwich, and Mr Morris, among which were some good

examples. There were also several collections of six Orchids, Mr Dodd having decidedly the best, among which was a fine bush of *Dendrobium nobile*, and *Lycaste Barringtonia*.

For six fancy *Pelargoniums*, nurserymen's class, Mr Turner had the best collection, the sorts being Evening Star, Madam Sontag, Celestial, Cloth of Silver, Lady Hume Campbell, Lady of the Lake. Messrs Fraser were second, with equally well done plants, but the sorts were older.

In amateurs' class, Mr Bousie of Stoke Park had the best, Mr Windsor second, Mr Weir third.

For twelve show *Pelargoniums*, Mr Turner was first, with well grown plants of Sanspareil, Carlos, Governor-General, Wonderful, Una, Zeno, Viola, Lucy, Saracen, Rosamond, Majestic, and Lord Raglan, a magnificent scarlet. Mr Dobson was a good second, and Messrs Fraser, third. There were several collections of ten plants, among which Mr Nye, gardener to E. Foster, Esq., Berks, was the best.

Tall Cacti were shown by Messrs Green, Grix, and Mortimer—Mr Green being as usual the most successful.

Among new things there was a very striking *Iris Susiana* from James Silver, gardener to Rev. H. Pole, Maidenhead, a very peculiar shaped grey speckled variety.

Mr Glendining, of Chiswick Nursery, had *Farfugium Grande*, a beautiful variegated plant, said to be quite hardy; also the Chinese rice plant, and the beautiful *Abies Kämpferi*, which cannot fail to be a favourite plant as soon as it is better known. From Mr Cutbush of Barnet, there was the pretty *Genethylus Hookeriana*. Mr Cutbush of Highgate had the very beautiful forcing *Geranium Blanch Fleur*, which is likely to displace all other light coloured varieties for forcing purposes. Mr Veitch sent the large creamy white *Rhododendron Veitchii*. From Mr Turner there was a number of seedling *Pelargoniums*, the best of which appeared to be Mr Ingram's and Mr Warnock's. Mr Salter of Hammersmith had a collection of variegated plants, mostly hardy sorts; and from the Messrs Paul were a very beautiful collection of New Roses in small pots well flowered, and from the same firm a new dwarf Pea in pots, with a most abundant crop of Peas ready for table. So dwarf and compact is this Pea, that it can be grown in as little room as French Beans, it being no taller. It cannot fail to be extensively grown in large establishments where Peas are forced.

BEDDING OUT SUMMER FLOWERS.

THE important operation indicated above will now commence in most gardens, although it will not be safe to put out the more tender exotics till the end of May. But Scarlet *Geraniums*, *Verbenas*, and other plants are hardy enough to be exposed without much risk from frosts; and, even if a little checked while in their destined places, the injury will be compensated

by their forming roots in the new soil, and thus becoming established. Presuming then that our readers will have discretion enough to guide them, so as not to lose or materially damage any of their stock by haste and impatience, we will sum up all we have to say on "bedding out" for the present season, in a few miscellaneous practical hints.

As to soil, it may be laid down as a rule that a rich one, or one highly manured, is not suitable for bedding plants, which are grown not for the foliage but for the flowers; yet this remark must not be construed to mean that poverty of soil is of no consequence. If flower-beds are treated once a year to a dressing of leaf-mould, all will be done that is necessary; or, if leaf-mould is not at hand, a compost of fresh loam well mixed with thoroughly rotted frame manure will do as well. If, therefore, this was attended to in the winter, nothing further will now be necessary; but if the beds have had no dressing of the kind during the past year, some little assistance should now be given them. Dig with a fork or trowel each place which a plant is intended to occupy, and mix a little of the compost we have mentioned with the garden mould. This will give sufficient stimulus to vegetable life without producing any of the rank and luxurious vegetation which richer manures would occasion, with the result of having fewer flowers.

Before the plants are turned out of the pots each one should have a general inspection, in reference to several particulars. If greenfly is discovered, it must be all cleared away. Long, lanky shoots should be shortened, as a bushy, compact growth is a prime requisite in plants in all circumstances, and not less in the open air. If properly attended to, all this will have been done to the plants previously; but, as this is a matter often neglected, it is necessary we should lay stress upon it. People are very apt to save a flower or a plant at this season; but this can only be done, generally, at the expense of the regular compact growth of the plant itself, and therefore it will be better to shorten flowering shoots and to wait patiently for a general blooming, than to have a straggling flower here and there in the bed. We have often seen Geraniums put out with a lot of long branches tied to sticks; and we feel sure that such treatment is quite incompatible with future beauty. A bedding plant should not require stakes in any period of its growth, least of all at the commencement, and therefore we would advise that all shoots which are not quite self-dependent should be shortened at once. If wanted, the cuttings may be struck to fill up gaps later in the season.

As far as possible, every plant should be pegged down neatly in its place, so as to give an early direction to the shoots. This advice is applicable, not only to trailers, such as Verbenas, but also to shrubby plants which naturally have an erect habit. A scarlet Geranium should be trained so as to throw out its branches in a horizontal direction, and then each one can be pegged down in the bed. The effect will be very mechanical and formal at first, but the ultimate benefit will be great in every way. If the pegging is properly performed, the plants will be able to sustain any blasts of wind without being moved from their places—a most important consideration everywhere, but especially in exposed situations. In pegging down, the branches should, as far as possible, be trained from a common centre, and it will be better to cut out those which will not harmonise with such an arrangement. Allow plenty of room—a matter too little attended to. Plants should not be crowded, but allowed just to meet each other when at the height of their beauty. Two feet apart every way is quite close enough for Verbenas; but, of course, plants of more diminutive growth must have closer quarters. Do not forget to consider the height, colour, and general habits of the plants which are put out, for it will be very provoking to find you have put the same colours together when too late to rectify the mistake.

Crush the ball of earth a little, as each plant is taken from the pot, and water freely. If you can allow yourself to choose time and season, prefer a quiet cloudy day to a bright windy one for the operation; and, as a rule, evening is better than the morning. But in large establishments the work

must be done all day long, and the gardener will give his best attention so to dispose his plants that the roots shall be disturbed as little as possible.—*The Field*.

CALEDONIAN HORTICULTURAL SOCIETY.

An interesting competition of the above Society took place in the Experimental Garden on Saturday the 9th May. The following is a list of the prizes awarded :—

The prize for Greenhouse Plants, in the Nurserymen's Class, was gained by Messrs J. Dickson & Sons, Inverleith Nursery, with *Azaleas Stanleyana* and *Prince Albert*, *Boronia Drummondii*, and *Pimelea Nepergiana*.

For the best two Stove or Greenhouse Plants produced by practical gardeners, there were four competitors. The Silver Medal was awarded as first prize to Mr Thomas Blair, gardener to G. C. Arbuthnot, Esq., Mavisbank, Loanhead, for *Leschenaultia formosa* and *Pimelea spectabilis*. A second premium was assigned to Mr Lockhart, gardener to R. Dundas, Esq., of Arniston, for *Leschenaultia formosa* and *Pultenaea stricta*; and a third to Mr Hugh Ritchie, gardener, to Mrs Hamilton, Parsonsgreen, for *Calceolaria violacea* and *Pimelea decussata*.

For the best two Cape Heaths, the Silver Medal was awarded to Mr Ritchie, Parsonsgreen, for *Erica ventricosa coccinea minor* and *E. linnæoides nova*. A second premium was voted to Mr Lockhart, Arniston, for *E. Beaumontiana* and *E. ventricosa grandiflora superba*.

For the best three Cape Heaths, in ten inch pots, the first prize was awarded to Mr Lockhart, Arniston, for *E. ventricosa coccinea*, *E. ventricosa densa carnea*, and *E. jasminoides nana*. A second premium was assigned to Mr Blair, Mavisbank, for *E. linnæoides superba*, *E. perspicua nana*, and *E. vasiflora*.

For the best Perennial Climbing Plant, the Silver Medal was awarded to Mr Blair, Mavisbank, for *Tropæolum tricolorum*, trained in form of a vase. A second premium was assigned to Mr Lockhart, Arniston, for a plant of the same species, neatly trained in a balloon form.

The prize for the best two Indian *Azaleas* was awarded to Mr James Henderson, gardener to C. K. Sivewright, Esq., Cargilfield, for *Egertoni* and a neat plant of *Iveryana*, covered with bloom.

The Silver Medal was also awarded to Mr Henderson, Cargilfield, for the best three Indian *Azaleas* in 8 inch pots, the kinds being *Prince Albert*, *Stanleyana*, and *Purpurea superba*.

The prize for *Cinerarias* (Silver Medal) was awarded to Mr W. McFarlane, gardener to C. W. R. Ramsay, Esq., of Barnton, for well-grown plants of *True-love*, *Lady Paxton*, *Optima*, and *Scottish Chieftain*.

For the best twelve Pansy blooms, the prize was awarded to Mr McFarlane, Barnton, who produced good blooms of the following sorts :—Sir Colin Campbell, Mrs E. Barclay, Nonpareil, Alice, Sir C. Napier, Louise, William, Climax, Mary Taylor, Sir J. Cathcart, Cyrus, and Jeanie. A second premium was voted to Mr Henderson, Cargilfield, whose sorts were—*Flower of the Day*, *Minerva*, Mrs Dodwell, Jeanie, Lord Raglan, Cyrus, Royal Standard, Monarch, Alice, Mesmerist, Earl of Cardigan, and Nonpareil.

The prize for Hardy Herbaceous Plants was awarded to Mr Falconer, Canonmills, Cottage, for *Pulmonaria grandiflora* and *Euphorbia spithymoides*.

The prize for Alpine Plants was also awarded to Mr Falconer, Canonmills Cottage, the species produced by him being *Mitella diphylla*, *Arenaria balearica*, *Schivereckia podolica*, and *Androsace villosa*.

The prize for Exotic Variegated Plants was awarded to Mr Blair, Mavisbank, for *Begonia hybrida*, *Aspidistra japonica variegata*, *Coleus Blumei* (variegated), *Maranta bicolor*, *Agave americana variegata*, and *Cissus discolor*.

The Silver Medal was awarded to Mr Blair, Mavisbank, for the best twelve Ferns. His collection contained well-grown specimens of *Polypodium angustifolium*, *Pteris hastata*, *Adiantum affine*, *formosum*, and *assimile*, *Polypodium crassifolium*, *Lomaria attenuata*, *Allantodea umbrosa*, *Pteris rotundifolia*, *Polystichum proliferum*, *Asplenium viviparum*, and *Doodia rupestris*. A second premium was voted to Mr Falconer, Canonmills Cottage, whose collection included *Pteris tremula*, *Asplenium fontanum*, *Cystopteris montana*, and other interesting species.

For Culinary Vegetables the prize was awarded to Mr John Logan, gardener to William Ivory, Esq., St Roque.

The prize of Two Sovereigns, offered by the Office-Bearers for the best collection

of Stove or Greenhouse Plants, was awarded to Mr John Paterson, gardener to Professor Syme, Millbank, for excellent specimens of the following:—*Boronia denticulata*, *Podolobium triangulare* and *trilobatum*, *Cytisus racemosus superbus*, a fine plant, of a very superior variety; *Erica Cavendishi*, *E. perspicua nana*, and *E. propendens*, also a fine plant; *Azalea vesta*, *optima*, *lacteola*, Duke of Devonshire, *aurantia* and *lateritia alba*; *Deutzia gracilis*, *Pultenaea stricta*, *Pimelea spectabilis*, the gem of the collection; *Eriostemon cuspidatum*, *Tropaeolum tricolorum*, and *Rhododendron Gibsoni*.

The prize of One Guinea, offered by Messrs Dicksons & Co. for the best twenty-four Pansies, was awarded to Mr Thomas Reid, gardener to William Wilson, Esq., Broomfield, Blackhall, whose stand contained fine blooms of the following sorts:—Mrs Dodwell, Miss Walker, William, Mary Taylor, Alice, Sir C. Campbell, Earl of Mansfield, Sir J. Cathcart, Nonpareil, Duchess of Wellington, Lousie, Lord Dunfermline, Sir C. Napier, Marchioness of Bath, Royal White, Mary, Emperor, Climax, Jeanie, Christina, Argo, Catherine Dundas and Cyrus.

In addition to the productions sent in competition, a number of extra articles were placed on the tables for exhibition only. From Messrs J. Dickson & Sons, Inverleith Nursery, were *Boronia tetrandra*, *Epacris Christisoni*, with *Auriculas*, &c.; from Messrs P. Lawson & Son, Golden Acres, a collection of rare Conifere, including *Pinus Pattoniana* and *Hookeriana*, *Thuja Craigiana*, *Cupressus Lawsoniana*, and *Larix Kämpferi*, together with good specimens of greenhouse plants; from Messrs Dicksons & Co., Leith Walk, *Azalea amœna*, *Heaths*, *Begonias*, and other exotic plants; from Messrs Downie & Laird, fine *Cinerarias* and 36 sorts of Pansies mostly new varieties; from Messrs Cunningham, Fraser, & Co., Comely Bank, a fine specimen of *Viburnum macrocephalum*, together with *Azalea*, Duke of Devonshire, *Deutzia gracilis*, &c.; from Mr R. M. Stark, Edgehill, *Illicium religiosum*, and other greenhouse plants, and a few interesting Ferns; from Mr C. Alexander, Larkfield, *Rhododendron splendens* and beautiful *Cinerarias*; from Mr Douglas, Rosebank, a collection of fine stage *Auriculas*, with blooms of *Cinerarias* and Pansies; and from Mr Forrester, Ratho, two boxes of good *Auriculas*.

From the garden of Samuel Hay, Esq., Trinity Cottage, were fine specimens of *Azaleas*, *purpurea magnifica*, *aurea*, &c.; from C. K. Sivewright, Esq., Cargilfield, fine *Azaleas*, and a large well-bloomed plant of *Dielytra spectabilis*; from Mr Lockhart, Arniston, a fine plant of *Leschenaultia formosa*; from Mr McFarlane, Barton, three fine *Cinerarias*; from Mr Melville, Dalmeny Park, Purple Intermediate Stocks and Seedling *Cinerarias*, for one of which a Certificate of Merit was granted; from John Mood, Esq., Rosehall, a well-bloomed plant of *Calceolaria violacea*, and good *Auriculas*; from Mr Gavin, Hopetoun House, four Pine Apples—viz., a Queen, a Trinidad, and two smooth Antiguas; from Mr John Beveridge, Whitehouse, Musselburgh, a box of Seedling Shrubby *Calcearias*; from Mr Anderson, Oxenford Castle, flowers of a Seedling *Azalea*, semidouble and of a novel colour.

Mr Taylor, market gardener, Inverleith, exhibited good Broccoli and Mr Ewan Cabbages. Mr Jameson, fruiterer, sent a bunch (25 heads) of giant *Asparagus* grown by Mr G. Bessent, Barnes, Surrey, which weighed 3 lb 2 oz. Mr Laing 12 Leith Street Terrace, exhibited several improved watering pots.

The Exhibition was greatly enhanced by specimens from the Society's Garden, including *Azaleas*, *Cinerarias*, &c., and a fine plant of *Rhododendron Edgeworthii* bearing trusses of unusually large flowers, there being four or five in each truss; also fruit-trees in pots from the Orchard House, covered with blossoms.

THE CENTRAL FRENCH HORTICULTURAL SOCIETY.—The annual exhibition of the Horticultural Society was opened on Wednesday, the 20th ult., at the Palace of Industry. The grand nave of the building has been transformed into a large garden, laid out with great taste, and the show surpasses in beauty those of previous years. The central part represents a large grassplot, having in the centre a picturesque mass of rockwork, surmounted by a group of eagles. The water from a fountain within the rocks falls in a cascade amidst a quantity of heath, and, after falling into a basin, runs in a small rivulet through the other part of the garden, and is in one place crossed by a small rustic bridge, which produces a very picturesque effect. In addition to the flowers and shrubs of every description being exceedingly fine, the part of the building devoted to fruits and vegetables contains some admirable specimens.

—*Times' Correspondent.*

LARGE AMERICAN OAK.—I cut the following from a Canadian paper received this morning. It will give some idea of the magnitude of a large Oak growing in North Carolina :—"There is said to be an Oak tree near Raleigh, N. C., which at the sun's meridian covers with a shade 9000 feet. It would afford shelter for 4500 men.—Geo. S. RODGERS in *Gardeners' Chronicle*.

THE GARDEN.—Warm weather has brought a plentiful crop of weeds to view in most gardens, and we are reminded of the necessity of a diligent use of the hoe. No policy is worse than leaving weeds to get large, for they waste the energies of the soil, often produce their seeds, look unsightly, and demand more labour for their eradication. It is a good plan to devote one day in the week all through the summer to hoeing the kitchen garden, so as to prevent any weeds attaining more than an incipient growth, and the operation will be highly advantageous to the growing crops. Warm weather also brings insects, and they must be diligently sought after. Roses should be gone over by hand, removing and putting into a basket all shrivelled leaves; and, as these contain the caterpillar, they must be afterwards destroyed by being trodden on. Greenfly can be kept under by frequent syringing. If the caterpillar appears in the Gooseberry bushes, lose no time in searching them out, for a day or two spent in the process will be well laid out. A good plan is to syringe the bushes heavily on the under side, and then to kill the caterpillars which fall by a rake or hoe; but it is better to search for the pests as soon as they emerge from the egg.—*The Field*.

CALENDAR OF OPERATIONS FOR JUNE.

VEGETABLES.

The bustle of spring digging, planting, and sowing is now about over, and thinning Turnips, Onions, Carrots, &c., &c., must be attended to. It is best to do this work in good time, as it is then easier done, and better for the crops. Celery, for a first crop, may be planted out as soon as possible, taking advantage of a dull day. If a good dose of water is applied, it will secure them. Plant Savoys, Cauliflower, and Cabbage, and about the end of the month a full supply of Brussel Sprouts and Broccoli for spring use. Penzance, Wilcove, and Waterloo late are very good sorts, and will keep a succession for three or four months. Sow a good supply of M'Ewen Cabbage; they are very useful in April, May, and June, and may be had the most of the year. Give Asparagus beds a top dressing; it is of great use to the well-being of next year's crop. Potatoes are coming away very kindly; work them with the grape hoe, and earth up in good time. Keep down weeds as soon as they make their appearance.

FORCING DEPARTMENT.

PINES.—Succession plants shifted in May will now be growing with rapidity and they must have every attention in the way of a moist growing atmosphere, and a good supply of water at the root, especially during hot and scorching weather. Give occasional waterings of dung or guano water. Syringe them lightly overhead every fine afternoon, and shut up with a temperature of 90° to 100° for an hour or two. By all means avoid keeping them long shut up in what is generally termed a close atmosphere, and give air early in the morning, increasing it by degrees till there be a free circulation of air about them by 11 o'clock, and always leave a little air on for the night. The fruiting plants for autumn supply should be "up" early this month, and if they have been grown near the glass, and have their pots well

filled with roots, and are altogether in a strong and healthy condition, little difficulty will be found in getting them to show fruit, if directions previously given are followed. Stock intended for winter supply should be encouraged to well mature their growth by a free admission of air, and a somewhat drier atmosphere than is desirable for general stock. This will induce them to rest partially for a time, when they will be much more likely to give good "shows" than otherwise. Early started plants are ripening their fruit this month. Do not withdraw moisture either at the root or in the air from these, but gradually decrease it as they change their colour, and give an increased circulation of air, especially when the external atmosphere is most warm and balmy, but at all times avoid admitting currents of dry air. Such are unfavourable to both the fruit and young suckers intended for succession stock. Whenever it is desired to retard fruit, remove the plants either to a colder house, or to a dry and airy fruitroom. It is common in some localities to cease firing Pines at this season, but such should not be hastily done, and it is much the best way to continue fires throughout this month—as checks from whatever cause are at all times most injurious to Pines in all their stages of growth. Maintain a steady bottom heat to all stock as directed in former Calendars.

VINES.—Give abundance of air to Grapes now colouring; and, more especially, should the weather be damp, keep up fires so as to secure a rather dry atmosphere, the aridity of which should be increased as the Grapes get quite ripe. In all houses where fruit is swelling maintain a high temperature; at least let the thermometer be kept from dropping below 73° at night, with a humid state of the atmosphere. Look over Grapes now ripe, and remove all shrivelled and shanked berries where there are any. Keep them cool and dry. Wherever red spider makes its appearance, warm the heating apparatus and wash it over with a mixture of sulphur and lime reduced to the consistency of paint. In houses where the fruit is all cut, apply the syringe or engine daily; admit a free circulation of air day and night, remove all laterals, and induce the Vines to remain in as quiet a state as possible. Late houses should now be encouraged, as they are on the move rapidly, and it is much safer to encourage than to retard, and it is best to make slight fires when the weather is dull and the nights chilly, for if these keep cold and damp, and there is the least tendency in the bunches to be wiry and loose, such is augmented by an atmosphere which is cool and moist. Pot Vines should now be got into their fruiting pots if not accomplished in May, or even in April. They should be stopped as soon as they run to from 4 feet to 5 feet in length, and be topdressed with rotten dung and watered every second time with liquid manure. Where young Vines have been planted out in borders this spring, all covering should be removed from the border, and the surface forked up and a slight dressing of horse droppings or short dung of any description be applied. Grow them on with a high temperature and a good supply of air, and if not intended to be cropped at all next season, allow them to make as much top as is consistent with your space and the free exposure of the foliage to the sun. The system of stopping, in order to strengthen the Vine, is decidedly erroneous. The main point the first year is to get a mass of roots, and a store of matter from which to get a vigorous growth for next year.

PEACH HOUSE.—In houses where the fruit is ripening, give a bountiful supply of air, both top and front, and see that the fruit is fully exposed to the influence of the sun, otherwise the flavour will be deficient. The editor of the *Gardeners' Chronicle* asked a week or two ago "what Peaches not properly ripened were worth?" We would answer worthless, and nothing should be left undone to give them flavour. It is good on fine days just as they are finishing to remove the glass altogether in the middle of the day where such can be done, and leave air on all night. When fruit is just stoned they may be pushed along, if desirable, with a smart temperature; at the same time giving the borders a good watering and a mulching with rotten dung. Keep up a genial atmosphere in later houses, and keep down

red spider and greenfly by the usual remedies. Keep your young shoots neatly tied in, and beware of over-crowding them.

ORCHARD HOUSE.—Persevere in a vigorous use of the syringe in this department, in order to keep down red spider, and see that at no time do any of the plants suffer for want of a good supply of water at the roots. If the mulching on the surface of the pots becomes hard and caked, partially remove it, and supply some fresh dung. Pinch off the extreme end of the shoots of Peaches, Nectarines, and Plums, and with the exception of the leading shoots of the Cherries, they should be cut back to spurs of about $2\frac{1}{2}$ inches in length, which will form abundance of fruit buds for another season. The tops of the shoots of Figs should be pinched out so soon as they make five joints.

STRAWBERRIES IN POTS.—As soon as healthy growing runners can be had, the necessary stock for another season's forcing should be laid in 60's pots, lay them in a light rich soil such as half loam, half well rotten leaf mould, with a dash of sharp sand, and when layered keep them well watered. For the forcing of these see last month's directions.

CUCUMBERS AND MELONS.—Maintain a moist growing atmosphere to Cucumbers, and let the temperature be kept up, so that the thermometer stand at 75° , with a little air on all night. Syringe them every afternoon during hot weather, and shut them down close for a couple of hours—this wonderfully refreshes the plants during bright weather, and the Cucumbers will swell out more rapidly. Do not on any account allow the frames to get crowded with Vines and foliage. Look over them every two or three days, and stop and regulate as necessary. Slightly top-dress the bed with rotten dung at intervals of three weeks, and water occasionally with liquid manure. Attend to the impregnation of melons, and just allow sufficient foliage to well cover the surface of the bed. Give fruit that is ripening plenty of air and warmth. Sow for late crops towards the middle of the month.

FLORISTS' FLOWERS.*

HOLLYHOCKS.—These will now be beginning to grow freely; be careful that they receive no check—should dry weather set in—from drought. Encourage the growth of the weaker growing sorts, by watering occasionally with liquid manure. Mulch with rotten dung those planted on light sandy soil. Look well after slugs.

DAHLIAS, when newly planted out, will require great care to protect them from slugs and from being injured by rough cutting winds. To encourage the growth, stir the surface of the soil amongst the plants, and keep them well watered with soft water; also, in dry weather, syringe them overhead at night. Take every means to keep the earwig under as early in the season as possible.

PANSIES.—Those intended for exhibition either in pots or beds, should be shaded from bright sunshine, rain, &c. Water the beds freely in dry weather with rain or pond water, and by all means keep down slugs, earwigs, &c. Continue to take off cuttings, more especially of the newer and finer sorts, as many plants die off about the end of the month, and give but little warning. When cuttings can be got, the opportunity should not be lost. Examine seedling beds carefully, marking those that appear to have superior properties. Save seed only from those which have their colours well defined, smooth edges, good substance, &c.

PELARGONIUMS.—See last month's Calendar; only be careful that watering, shading, etc., is judiciously done so as to prolong the bloom. Commence early to propagate fancy varieties, as many of the sorts will be found difficult to strike.

CINERARIAS.—If seed is not wanted, these should be cut down, and placed in a shady situation to produce cuttings; these taken off when of sufficient length root freely in a gentle hot-bed. Gather seed only from such sorts as have good properties and distinct colours; this should be sown at once so as

* By Mr J. Downie, of Downie & Laird.

to have the plants well established before winter. Where there is any appearance of mildew, dust with flour of sulphur. Should there be any appearance of greenfly, fumigate before the plants are set out.

PHLOXES IN POTS will be greatly benefitted by an occasional application of weak liquid manure water, at least once a week; water carefully on all other occasions, never allow them to suffer from want of it.

VERBENAS IN POTS.—Pay every attention to the training of these, so that the plants may be kept neat and uniform. Give air night and day in fine weather. Fumigate occasionally to keep down greenfly.

AURICULAS.*—Continue the treatment recommended for last month with respect to watering, air, shade, and cleanliness. Pay particular attention to the interior of the plants, and observe whether caterpillar has effected a lodgment; destroy them without fail, otherwise they will devour the whole of the interior of the plant; keep the plants free from greenfly, and stir the surface soil in the pots whenever it becomes hard.

POLYANTHUS.—Keep them as much out of the sun as possible, but free from the drip of trees; supply them regularly with water, and to encourage new fibres from the neck of the plants, topdress with some fine leaf-mould, with some silver sand mixed with it; keep the plants free from vermin; should the plants be in pots, they may with advantage be plunged in the open ground, in an open, airy situation.

TULIPS.—So soon as the bloom as on the decline, expose the beds to the weather, break off the seed vessels, and remove all wreck from the surface of the bed. By the end of the month, the bulbs will be ready for taking up, the criterion to judge from is when the stems will double up without breaking; as the bulbs are lifted, cut away the stem about two inches from the base of the bulb, trim the fibres, and place the bulbs in their drawers; lay them in a cool airy place to dry gradually.

PINKS.—Attend to the securing the flower stems to the blooming sticks; continue the disbudding of those intended for show, paying attention to the habit and growth of the plants; in dry weather water liberally, and during the month liquid manure may be applied twice a-week. Very few of the fine varieties now in cultivation are what are called "busters," but those that are full will require to be watched, and the calyx eased, and a narrow strip of Cuba bast tied round; don't tie too early, for fear of injuring the bloom. When the guard petals fall, the bloom will require to be shaded: one of the new invented tin shades, fitted to the stick with a screw, suits most admirably; or a small bell glass, coated inside with whitewash, will do. As the guard petals expand, fit the cards to the blooms, and secure them with wires to the sticks. Prepare some fine leaf-mould, with a little light loam and silver sand well mixed, for striking the pipings in the beginning of next month.

RANUNCULUS.—Give every attention to these beautiful flowers during the month. Keep the surface soil finely broken and the beds free from weeds. Allow them to have all the rain that falls till the flowers begin to show colour, when they will require to be protected by a low awning from rain and strong sunshine. When the weather is dry only allow the awning to be down on the side next the sun. Give all the air possible to prevent the flower stems becoming drawn. When the flowers are in bloom give the plants copious waterings with rain or pond water. Do this in the evening when the sun is off the bed. Administer the water through a fine rose held low down between the rows, and use every precaution not to wet the blooms. Flowers for show that are wanted large may have the lateral blooms cut away with a pair of sharp scissors. Never use a knife for fear of pulling up the root.

CARNATIONS AND PICOTEEES.—These flowers have encountered severe weather since potting out. With slight protection they have sustained little damage. We may now expect more genial weather, and that the plants will make rapid progress. Continue to tie the stems to the sticks as they advance,

* By Mr G. Lightbody, Falkirk.

and see that they are not caught, otherwise the stem runs the risk of being broken. In dry weather water liberally in the evening. Destroy green-fly and other vermin. Stop all shoots spindling for bloom; leave only the leading stem. A weak solution of guano water may now be given once a week with advantage to the growth of the plants. Prepare some fine leaf mould, light loam, and old rotten dung in equal proportions for top dressing, and at the end of the month topdress the plants with it. Disbud all the weak lateral pods so soon as they can be slipped. Allow only the three leading buds to remain on each stem.

CHRYSANTHEMUMS.*—Those for cut blooms should receive their final shift as soon as possible, using plenty of broken oyster shells—sifted—the smallest mixed with the compost, the coarse used as drainage. Place a few of the late flowering sorts against a south wall, such as King, Two-coloured Incurved, &c. Specimens should be potted into their blooming pots as soon as they are sufficiently "broke" after the last pinch. Stake at once, as by so doing there is no chance of injuring the young roots afterwards.

POMPONES.—Continue treatment recommended last month, and as the pots get filled with roots, plunge up to the rim in coal ashes. Be careful never to allow the Chrysanthemum to get dry.

AZALEAS.—Continue to re-pot, if required, as the plants go out of bloom; remove all seed vessels. Have a watchful eye to thrip. Should they make their appearance, fumigate till they are got under. Plants having their flower buds set should be hardened off to stand out during summer.

EPACRIS.—Gradually harden off early. Cut down plants and plunge them in a rather sunny situation to mature their wood, and set their flower buds. Young plants that have not broke well should be pinched to make them more furnished.

NOTICES TO CORRESPONDENTS.

POLYANTHUS.—C. S., Berwickshire.—Your seedlings, Border Beauty, and Queen of May, are no improvement on existing varieties. Border Queen is the best. Your seedling Pansy, Lilacina, is a very pretty flower, beautifully laced with rosy lilac; but, on account of roughness and want of texture, it will only be useful as a border variety.

AZALEA.—A. SHEARER, Yeaster.—Your seedling 12 is a large, bold, attractive flower; colour, lively rosy scarlet, faintly spotted with rosy crimson; a little deficient in form when compared with such sorts as Chelsonii and Stanleyana. Cineraria No. 4 is a fine variety, white tipped with light rosy purple, dark disc, apparently a very free bloomer, although nothing new in colour. If the habit is good, it will be a very attractive variety.

MANAGEMENT OF THE VINERY.—Would you please let me know in your next Number what is the most intelligible work on the Management of the Vinery; or if there be any so plain as by its careful perusal a person might undertake the charge of one—depending upon it for his guide; and what would be the cost of the same?—**A SUBSCRIBER.** [There is at present no book we could recommend that would meet your case. The directions given in the Forcing Calendar of the *Scottish Gardener* will be found more plain and practical than anything of the sort we have seen. Such a book as you require is a desideratum in horticultural literature.]

GARDEN FENCES.—I would be obliged by your letting me know, through the first Number of the *Scottish Gardener* what kind of fence you would recommend me as a protection fence for the centre subdivision of my garden. It would require to grow to the height of five or six feet, and is very much exposed to northerly winds. I would also require a smaller and more ornamental fence, say about three feet in height. I do not like Elder, although it grows fast. You may also mention whether in your opinion it is now too late for planting it.—G. S. S. [Holly would be the best fence for the outside one, and Yew for the inside one; both may be planted at this season, if the plants can be got with good balls, and be watered well at the time they are planted.]

* By Mr Laing, Dysart Gardens.

THE SCOTTISH GARDENER.

THE THEORY AND PRACTICE OF HORTICULTURE.

NO. 9.—DEGENERATION IN THE CULTIVATED VARIETIES OF FRUITS AND FLOWERS.

THOUGH apprehensive of exhausting the patience of our readers, and therefore unfeignedly desirous of bringing this discussion to a close, we have still on our hands a few arguments of Dr Lindley which we shall endeavour to dispose of as briefly as possible. They are contained in the following passage :—

“In conclusion, let us ask whether it is considered to what the doctrine of vegetable degeneracy tends? If true, it would afford the strongest possible support to the advocates of progressive development. The ingenious author of the *Vestiges of Creation* could not have found a more able though doubtless an unintentional advocate than our friend the *Scottish Gardener*. For it is vain to say, I limit my theory to cultivated plants. Apples, Pears, Plums, &c., are no more cultivated than Oak or Ash trees. An orchard is but a wood under another name. If it is contended that the first contains grafted trees and the latter seedlings, we reply that that is by no means certain. Elms are more frequently layers than seedlings, Thorns are largely grafted, Willows and Poplars are struck from cuttings. Besides, it is not contended that degeneracy is brought about by grafting or budding, or similar operations; it is held to be constitutional in cultivated trees raised from seed. But are not almost all our forest trees now-a-days raised from the seeds of cultivated plants? Oaks in a plantation or a park are cultivated Oaks. It is mainly from their seeds that other Oaks are raised. According to the doctrine of degeneracy, the present race of Oaks has only a narrow span of life allotted to it. Planters must look to it; if indeed they do not perceive that the theory in question is a great

mistake. Its advocates really say this:—"The seedling of a wild plant possesses in complete integrity the perennial qualities of its parent; but if you cultivate it, the seedlings that spring from the cultivated plant lose its perennial qualities, and gain another sort of quality which is limited."—*Gardeners' Chronicle*, 1857, p. 212.

In reference to this singular passage, we must, with all deference, remark generally, that we hardly ever met with anything of the same length in controversy more marked by inaccurate thought and bold assertion. In animadverting on it for a little, we shall begin with the scientific, and then take up what may be called the theological part of the argument.

"It is vain to say I limit my theory to cultivated plants." We should like to know who has ever said that. Certainly not Mr Knight, nor any of his followers that we know of. They have held the principle of a determinate amount of vital force, varying in different species, and in different individuals, as existing in plants indefinitely. We say in *plants indefinitely*, when we go upon the evidence of observation and experiment, for that evidence has not yet covered the whole sphere of nature; but we say in *all plants without exception*, when we proceed on the ground of analogy, for all plants confessedly grow old, decay, and die. The supposed limitation exists only in the imagination of Dr L. It is true that we entitled our papers—"Degeneration in the *cultivated* varieties of Fruits and Flowers;" but we did so, because we were writing not for physiological, but horticultural purposes. We nevertheless argued the question in a general way; at the same time, every one must see that Mr Knight, and other horticulturists, naturally attended first and chiefly to cultivated varieties, as possessing most interest in themselves, and as having a more defined, and, therefore, a more easily traceable history. It is not usual to graft Oak or Ash trees; or if from some antiquarian enthusiasm, we did so propagate Wallace's Oak or Queen Mary's Thorn, there might be no distinctive character in the Oak or Thorn in question, to keep the facts in memory after the propagator had gone the way of all the earth. A Ribston Pippin Apple and an Acton Scotch Peach bear the record of their origin in themselves, and so are more available for establishing the theory in question. This consideration surely accounts for what may seem the disproportionate attention bestowed, in this discussion, on cultivated varieties.

With similar want of accuracy, not to say want of fairness, Dr L. remarks of "the doctrine of degeneracy," as he calls it:—"Its advocates really say this:—the seedling of a wild plant possesses in complete integrity all the perennial qualities of its parent; but if you cultivate it, the seedlings which spring from the cultivated plant lose its perennial qualities, and gain another sort of quality which is limited." The reader will observe that Dr L. has not ventured to affirm that Mr Knight, or any of his followers, have made such statements *totidem verbis*, in so many words. He affirms they *really*

say so and so—that is, such is Dr L.'s interpretation of their theory, and it is a misinterpretation. This is one of the passages to which we alluded in our May number, when we said that Dr L. cannot now be vindicated from misrepresenting—of course unintentionally—the opinions of Mr Knight. Mr K. never said that individual plants of the natural species are not of limited duration. In our first paper on this subject we remarked:—"Forest trees, and other wild plants might be equally amenable to Mr Knight's law, were they brought under its operation, but they are for the most part propagated from seed, and that mode of origination excludes them from comparison." What Mr Knight and his supporters *really* do say is somewhat to the following effect: the seedling of a wild plant ordinarily possesses in complete integrity all the normal characters of said plant, and among these its average constitution in respect to health, and its average amount of vital force; they further affirm that certain seedlings, occasionally of wild plants, more frequently of cultivated plants, exhibit qualities which make their farther cultivation desirable. The Green Gage Plum, for example, possesses more saccharine matter than the common *Prunus domestica*; the Nonpareil Apple has a finer flavour than the Wilding Crab: and so on of all cultivated fruits. Unfortunately, these desirable qualities are often accompanied with a congenital delicacy of health, which makes it necessary to place particular sorts on walls, or in other warm situations, and which renders them short-lived in unfavourable soils and climates. These *are* facts independent of all theories. On these facts "the advocates of degeneracy" do not found their whole case, though they accept of them, for the reason above explained, as affording the readiest and most definite evidence. This, however, is very different from saying what Dr L. asserts they really say. Into such a mistake as this, the learned Professor would scarcely have fallen, except from his resolute determination to regard species and their varieties as *in all respects* identical.

Again, Dr L. says,—“Apples, Pears, Plums, &c., are no more cultivated than Oaks and Ash trees. An orchard is but a wood under another name.” And farther—“Oaks in a plantation or park are cultivated Oaks.” Dr Lindley knows the orchards in England better than we do, but we must say, that if what he here affirms of them is literally true, the present is as dark a time, in these orchards, as was that period which intervened between 1750 and 1800, and which, as he thinks, was the cause of so much disease and death among fruit trees. Further, it seems to us an abusive employment of language to speak of Oaks, in ordinary plantations, and parks, as cultivated plants. Probably, indeed, they were raised in nursery seed-beds, and were planted out by the hand of man, and were pruned occasionally (perhaps not even that) till they were about 25 or 30 years of age; but after that period, and during the course of centuries, they may have no more been visited by any human interference, than if they had been growing on the

sides of Ben Voirlich. Talk of such Oaks as cultivated trees, or their Acorns as the seeds of cultivated trees! It is difficult to characterise the assertion that "Apples, Pears, Plums, &c., are no more cultivated than Oaks and Ash trees." Surely all such fruit trees are not in the dark and neglected orchards. There are some Pear and Plum trees on walls in England as well as in Scotland. There are some Apple trees on espaliers in both sections of the empire. Some Pear and Apple trees are grown as dwarf standards, or *en pyramide*, or *en quenouille*. Thousands of them are annually subjected to branch pruning, and not a few have the additional benefit of root-pruning. And yet it seems they are no more cultivated than Oak or Ash trees in plantations and parks. We should like to hear what Mr Rivers and a hundred other nurserymen, and what Mr Fleming, or Mr Errington, and a thousand other gardeners would say to such an assertion. We suspect they would employ certain conversational interjections, which spontaneously burst from men when they suddenly hear anything akin to the extravagant or the absurd; but which, though ready to trickle from our pen, respect for Dr Lindley and for ourselves obliges us to suppress in print.

"Besides," says Dr L., "it is not contended that degeneracy is brought about by grafting, budding, or similar operations." Unquestionably not; but it is contended that grafting, &c., give occasion and scope for the development of disease and degeneration in plants composed of woody fibre. Dr L. himself admits that by means of these methods of propagation disease may be so intensified as to exterminate particular varieties. Certainly, had plants been propagated only by the sowing of seed, the theory of Mr Knight would never have been broached. Every plant would have tended to live out its natural life, and if not destroyed by violence, or exhausted by oppression from without, would have died a natural death. The theory of degeneration, in trees at least, is a consequence of the abnormal processes of propagation. In the animal kingdom there is no multiplication by division, except in the obscure region occupied by the Polypes, Zoophytes, &c., and therefore there is nothing in animal physiology corresponding to the theory of Mr Knight.

Grafting, budding, &c., though not the direct causes of degeneration, have an important influence in that matter. We showed in Vol. V., p. 364, that, by having scions inserted into hardy and healthy stocks, certain plants may be made to flourish, on soils where they would perish, or at least dwindle on their own roots. We have also seen, that in the case of diseased sorts, decay and death may be precipitated by grafting. So great are the evils arising from the mal-adjustment of the scion and the stock, that some of the opponents of Mr Knight, such as Mr Saul in the *Florist*, have assigned it as one of the principal causes of the diseases of fruit trees. It is undeniable that grafted trees are for the most part not so long lived

nor so robust as seedling trees. The variegated Hollies in the pleasure grounds at Hopetoun House are perhaps the finest in the empire. When they first met our young eyes in 1816, they excited our wonder and admiration, and we have watched them closely since then. In the intervening period some have died of old age, nearly all have stagnated in growth, becoming thin a-top, scanty in foliage, and very "seedy" both in the literal and metaphorical sense of the word, while their green and ungrafted brethren have been growing with unabated vigour and rapidly increasing magnitude. In like manner Purple Beeches, Elms, Poplars, &c., when multiplied by grafting, are notoriously deficient in vigour. Who would take a grafted *Pinus nobilis*, or *P. Nordmanniana*, if he could get a seedling? Certainly not we.

In connection with this part of the subject, we give the following interesting and instructive extract from Mr Knight's Treatise on the "Culture of the Apple and Pear:"—After referring to the common life which exists in the parts of the same tree, and which he conceives is extended to the secondary trees grafted from it, he continues:—

"The roots, however, and the trunk adjoining them, appear to possess in all trees a greater degree of durability than the bearing branches, having a power of producing new branches, when the old have been destroyed by accident or even by old age; and I have found that grafts taken from scions, which have sprung out of the trunks of old ungrafted Apple and Pear trees, grew with much greater luxuriance than those taken at the same time from the extremities of the bearing branches. The former, in their growth assumed the appearance of young seedling stocks, and the shoots of the Pear were, like those, covered with thorns. Those propagated from the bearing branches frequently produced fruit the second year, but the others remained long unproductive. Other grafts, which were taken from shoots out of the large boughs of the Pear tree, in the intermediate space between the trunk and the bearing branches, partook, in their form of growth, of the character of each of the foregoing kinds, producing a much smaller quantity of Thorns than the one, but not entirely free from them like the other. Whence it appears to follow, that there is a progressive change from the roots to the extremities of the bearing branches, and probably an increasing tendency to decay; for the life of every tree is known to be greatly prolonged when its branches are frequently taken off, and it is compelled to reproduce its buds, or to make use of the reserved buds with which nature has provided it; and I have not the least doubt but that in the culture of the Apple and Pear, the life of each original tree might be prolonged to three times its natural period by robbing it of its branches as soon as the qualities of its fruit were known, and retaining it as a Pollard, or more properly in the state of the stools in a coppice which is felled at regular periods, for these are known to possess a much greater durability than the same kind

of trees when left in their natural state, and to produce a vigorous succession of branches during many centuries. It is, however, probable that after a certain period, each effort of nature will be inferior to the preceding; for timber trees, which have sprung from the stools of an old coppice, are always observed to attain a small stature, with an early maturity and decay. I believe this observation may be extended to every kind of tree, and that Elms and Poplars which are propagated by layers and cuttings would attain a much larger stature if raised immediately from seed." — *Apple and Pear*, Ed. 1809, p. 14—16.

We have extracted this passage for several reasons. It probably ought to be modified a little in one of its statements, for we conceive that the decay of an extremely old tree would be accelerated by pollarding; it, nevertheless, contains facts and ideas which are too much forgotten or overlooked in the present day. It is an excellent specimen of the candour and truthfulness of the great Horticulturist in his prime. Had he lived till now, some of his extremely logical opponents would probably have told him, that he had contradicted himself, and had virtually surrendered his theory. If we remember right, Mr Macintosh has said something to that effect. Mr Knight, however, in the true spirit of the inductive philosophy, did not withhold anything which he believed to be the truth, but boldly stated such facts as he knew, and manifestly held his theory in a sense which was compatible with them. It would be well that his successors would imitate his example. The extract, moreover, is valuable as it suggests an explanation of the success which attends many cases of propagation by layering and cuttings—a success which is supposed to be fatal to the theory of the limitation of the vital forces of plants.

On enquiry, we find that in the Scottish nurseries *Ulmus montana* is almost the only Elm propagated from seed; the other species are mostly grafted. Some of the white-leaved Poplars are increased from suckers, many of the others from layers, and a few from cuttings. The common Lime is generally layered, and the plants so obtained are employed as stocks for the other sorts. Willows, it is known, are grown from cuttings. Now what we desire to be observed is, that the stools for layers in all the various species are kept very much in the same state as the stools in coppices; only, they are cut in closely every year, and the vital force is thereby concentrated very powerfully in the roots and the fragmentary stems. Cuttings are obtained from stools very much in the same condition or from young vigorous trees. In both cases, then, the circumstances are exactly those which, according to Mr Knight, are calculated to produce robust and comparatively long-lived trees. It is, however, greatly to be doubted that the plants propagated in this way ever are equal to seedlings. For the last ten years, Messrs Lawson & Son of Edinburgh have abandoned the layering of Limes, and have raised great quantities of that tree from seed

obtained from the south-east of Europe. The same enterprising firm have sought supplies from Italy of the seed of *Ulmus campestris* and of various *Poplars*; and though they have not hitherto been so successful with these trees as with *Limes*, yet the strenuous efforts they are making afford sufficient proof where their commercial benefit as well as the advantage of arboriculture are to be found. We have not the slightest doubt that Mr Knight is in the right when he says that the trees "which are propagated by layers and cuttings would attain a much larger stature if raised immediately from seed."

This brings us to consider the fact obligingly pressed on our attention by Professor Balfour, as decisive of the whole question. As stated in our May number, he writes:—"I point out every year to my pupils a healthy vigorous Willow which has grown from a cutting in Mr Knight's garden, which tree *was stated by Mr Knight* at the time to be in the last stage of decay from old age. Dr Graham was the party who took the cutting from the tree under Mr Knight's own eye." Now, assuming the fact to be precisely as the learned Professor states it,—that is, supposing the derivation of the Willow in the Edinburgh Botanic Garden from the plant in the possession of Mr Knight to be quite certain, and supposing Dr B.'s plant to be really "healthy and vigorous," for on that point there may possibly be a difference of opinion—what does the fact alleged prove? Why nothing more than that Mr Knight was a little hobby-horsical in his old age, as original thinkers living in retirement are very apt to be, and that for once he was mistaken in his diagnosis of decay, a circumstance not very surprising, for he was not infallible, and "even the good Homer sometimes gets drowsy." The whole interest of the anecdote consists in its contradiction of a particular opinion entertained by Mr Knight. We must say that if this single fact—this *instantia solitaria*—is to be held as overthrowing a theory sustained by many independent proofs, we should desire to have a stronger certification of its verity, than can be afforded by a mere tradition. Myths, as well as weeds, may spring up in Botanic Gardens, especially when there has been a change both of Professor and Curator. Some years after the death of the first Napoleon, the country was inundated with slips of Weeping Willow from his grave at Longwood; the nurserymen were pestered with people bringing cuttings to be converted into rooted plants, and we have heard one of them tell with glee, how when his patience was exhausted, he quietly supplied his "friends," from his own nursery lines, with plants which had never been within thousands of miles of St Helena. Of course such tricks were impossible in the Royal Botanic Garden Edinburgh, we do not insinuate the slightest suspicion of anything of the kind; but we say that there is nothing in which mistake is more likely to occur than in single cuttings—of Willows, for example—particularly, in large establishments. Is Professor Balfour quite sure that

there has been no mistake in this? Surely in proportion to the importance of the use which is to be made of a fact, the more indubitable ought to be the evidence which establishes it. There are probably far more false *facts* than false theories current in the natural sciences, and it does not abate the worthlessness of such *facts* that they are credited by persons deservedly invested with authority.

We are somewhat surprised by the importance attached by Dr Balfour to his pet fact. He records it in his Class Book. He exhibits it annually to his students. In a note to the Editor of this Journal he almost challenges us to publish it. It is his main, and for aught that we can see, his sole contribution to the evidence against Mr Knight. It would not have been remarkable that persons with little scientific culture should have considered one fact decisive, for with such, seeing is believing, and one circumstance that impresses the senses will countervail a thousand related in words; but it is somewhat astonishing that a man of academic habits, and a distinguished teacher of science, should have shown the same facility in belief and want of critical severity of judgment. Here is another sort of fact, and one that tends to shake our reliance on authority in matters of the kind.

We may be permitted to say, and we say it with sincere respect for Dr Balfour, that the sections in which he adverts to Mr Knight's theory do not appear to us to be equal in value to the rest of his excellent Class Book on Botany. They have very much the air of a hasty compilation. They do not impress one with the idea that he had considered very carefully the position which he adopts and defends. He hardly seems to have taken the trouble to master completely the theory which he opposes, for he gives at least two brief statements of it that are as inaccurate as any in the writings of Dr Lindley. Indeed, the matter is wonderfully, and to us unaccountably, the same in the works of both Professors. Dr B.'s book, however, was published first. Dr Balfour, like Dr Lindley, adduces Dr Henderson's pretended identifications of the Vines mentioned by Columella.* The Jerusalem Artichoke again figures before us as showing no debility, though propagated by tubers since 1616. And "Ecce iterum Crispinus!" the Couch Grass appears once more as "propagated by its creeping stems, and yet, unfortunately for the farmer, as vigorous as ever!" It is not easy to keep one's temper with this same Couch Grass. We were disposed

* In our number for December last, before we had seen Dr Henderson's work on Vines, we ventured to say that if Dr H. had succeeded in identifying any of the Vines of Columella, he had performed a philological miracle. His volume is now before us, and it is with difficulty that we refrain from quoting at length the whole passage relative to the ancient Vines, as a specimen of the kind of evidence, that is accepted in inquiries of this sort. Suffice it to say, that he begins with cautious inference or rather conjecture, and on the strength of a demonstrably false etymology, ends in positive assertion. It is not very creditable to the science of the present day that such speculations should be adduced as of decisive authority.

to excuse imperfect knowledge of an agricultural weed in Dr Lindley, who has spent the great part of his active and most useful life in close connection with gardens of all kinds—Experimental Gardens, Winter Gardens, Horti Sicci, &c., &c., &c., in the midst, or in the vicinity, of the noise, and bustle, and smoke of the great Babylon; but it does awaken our special wonder that Dr Balfour, who is second to none in Britain as a field botanist, should have overlooked the fact that *Triticum repens* is propagated quite as much by seeds as by its creeping stems. We have read somewhere that the Couch Grass has gone to Australia, and is there as much “the footprint of the whites” as is *Plantago Major* in North America; and most assuredly its creeping stems did not stick to the shoes of our emigrants in their long voyage to the Antipodes. Mr Masters has already asked what the Garlic of Ascalon has to do with the matter in debate, and notwithstanding Dr Lindley’s curt assertion that it has, the question appears to us a pertinent one. We cannot help thinking that the adduction of such plants as *Acorus*, *Achimenes*, Garlic, Jerusalem Artichoke, and Couch Grass betokens either an inadequate comprehension of the problem proposed, or a total misconception of the grounds on which it is to be solved. On the whole we submit that Dr Balfour has added only the weight of his name to the opposition against Mr Knight.

It remains to take some brief notice of the theological argument which Dr Lindley has levelled against us, and which, doubtless, knowing, as we suppose he did, the authorship of these papers, was meant as a home stroke. “Let us ask” he says “to what the doctrine of vegetable degeneracy tends? If true it would afford the strongest possible support to the advocates of progressive development. The ingenious author of the *Vestiges of the Creation* could not have found a more able, though doubtless an unintentional advocate than our friend the *Scottish Gardener*.”—*Gardeners’ Chronicle*, 1857, p. 212. Dr L. will bear with us when we say that he is clearly not so great in natural theology as he is in some branches of natural science. It may be proper to explain to some of our readers that the theory of the *Vestiges* is a version of an infidel theory by a French naturalist Lamarck, in which he dispenses with a Creator altogether. It is usually called *The Theory of Creation by Law*, or more accurately *The Theory of Creation by Spontaneous Development*. Dr L. is not quite correct when he calls it the doctrine of *progressive* development, leaving out the word *spontaneous*, for independently of all theories and beyond the reach of all confutation, geology has established the fact of a progressive development in both the vegetable and the animal kingdoms. According to the theory of Lamarck and the author of the *Vestiges*, all plants, in consequence of some plastic power in nature, have spontaneously developed themselves from the simple primary vegetable cell. So the simple primordial cell of animal matter is the self-evolving element which has produced the entire series of living creatures, and

at last man, the present crown of the whole. This was very much poor Topsy's theory of herself, for "she 'spected that she had not been made, but grewed." The publication of *The Vestiges of the Natural History of the Creation* awakened considerable alarm among the friends of religion, who very properly regarded it as an attempt to weaken, if not to nullify the proofs of the personality of the Creator. Very recently, a Rev. Professor at Oxford has endeavoured to show that the alarm was unnecessary and unreasonable. We do not think so; but be that as it may, we contend that our humble speculations not only do not give "the strongest possible support" to the theory of the author of the *Vestiges*, but that they afford it no support at all. Had Dr L. brought the charge against his friend the late Dean of Manchester, it might have some appearance of truth. That gentleman entertained some strange notions about the origin of the species and varieties of plants, which the reader will find expounded at length in the second vol. of the *Journal of the London Horticultural Society*. Mr Herbert appears to have imagined that only one plant of each genus, perhaps only one plant of each natural order was created at first, and that all the present species were left to develop themselves respectively from the primal ones. He thought he could even name the present species which are nearest the created types of the *Amoryllidaceæ*. In the papers above referred to, he labours to show that his views are consistent with theism, with what success it is not for us to say; but it is generally supposed that he was the original of the semi-heretical Dean described by Mr Kingsley in his *Alton Locke*. Were this the proper place, we might show that our theory is precisely the reverse of that propounded in the *Vestiges*, viz., that the laws of Nature are only the rules which the personal Creator observes in his actual workings—workings that are going on still, as certainly and as universally as in the primary periods of Creation, though attended with fewer new introductions. We hold that the Creator presides at the formation of a variety as well as of a species. To us, creation and conservation appear dependant on the same direct exertion of Divine power. Perhaps Dr L. will be inclined to reply, that may be your theory, but you are no more logical in carrying it out, than the Hon. and Rev. Mr Herbert was. We cannot think so, for two reasons. *First*, the origination of varieties is an admitted and undeniable fact—a fact occurring every day in the vegetable world—and it is on that fact alone that the advocates of progressive and spontaneous development can found, if indeed they can derive any support from it. To us it seems that it affords them none. But *secondly*, we have not been speculating in any way on the origin of varieties; on the contrary, accepting of their existence, we have been considering their tendency to extinction. *Development by origination* is evidently a conceivable idea; *development by extinction* is one of the most self-contradictory that we have ever heard of.

And, now, we trust we are done with the subject as a controversy. We beg to thank Dr Lindley for his courtesy to us in the course of it, and we shall be very sorry, if it shall appear, that our less practised pen has not been guided by the same spirit. We suspect that Dr L. will be ready to say of us, as Ajax said of his opponent, in another sort of contest, "*mecum certasse feretur*"—"it will be told that he has had controversy with me." The *Scottish Gardener* has had a passage of arms with Dr Lindley. Oh, the vanity of this *Scottish Gardener*! He compares himself to Ulysses about to win the arms of Achilles. But he has not yet won the battle. As to the winning of the battle, that is for those who have read both sides, to judge. We shall be content if it be accounted a drawn battle in the meantime. Our desire is that Mr Knight's theory should remain an open question, and should receive the attention which it intrinsically merits. Of late years the names of De Candolle, and Mohl, and Lindley, and Balfour, and others—men of acknowledged authority in their own sphere—have lain like a dead weight upon it, to the exclusion of free thought on the subject, and the suppression of vigilant enquiry. Aware of the idolatry of names in the horticultural world, we entertain the apprehension that all we have said will be of small avail in arousing the public attention. We would put it to men of common sense to consider whether the parties who have been assumed as oracles in this matter, deserve the vast amount of deference that has been paid them. Surely great skill in the use of the dissecting knife and the microscope, or unrivalled acuteness in discerning the specific differences of plants, or even that rarer power of seizing general analogies, and of forming comprehensive combinations, which has been exhibited by a Linnaeus, a Jussieu, an Endlicher, or a Brown, does not necessarily infer an unusual capacity for reasoning or the summing up of evidence. Many years ago, the late Sir William Hamilton demonstrated in the Edinburgh Review, that mathematicians, while every day employed about reasoning of a particular kind, are, generally speaking, among the worst reasoners going. Probably he might have extended the same remark to the vegetable physiologists. They are wonderfully acute and sagacious in regard to everything they can see through lenses, but with respect to everything they cannot see in that way, they do not seem a whit more clear-sighted than other folks.

REMARKS ON FRUIT TREES IN GENERAL.

BY MR R. ERRINGTON, OULTON PARK, TARPORLEY.

PRESUMING that the *Scottish Gardener* has a liberal circulation amongst the class commonly termed amateurs, a few brief hints on cultural and other matters may not be unacceptable to those ladies and gentlemen who do not keep a professed gardener. First,

then, the Apple, everybody's fruit. There has been much discussion of late about the wearing out of fruit trees, and the Apple has been often quoted in illustration of the matter. I must confess to some astonishment at finding clever and experienced men charging the failure of the old Golden Pippin, the Ribston, and others, on neglect of culture. During the last thirty years, I have taken as much pains in cultural matters, with the Apple, as most gardeners; but plant and manage how I may, I cannot produce a good crop of Golden Pippins, or preserve the Ribston from canker. I have planted fine young trees, apparently full of health and vigour, on pure maiden loams, with an impervious substratum of stone, and still the canker attacks the Ribston: as for the old Golden Pippin, the trees carry all the marks of premature age from their very commencement. I have tried them on soils rich in manurial matters, as well as plain loams, but with similar results. Now, if this be not wearing out, what is it?

I should much like to be informed what title to give this generally admitted fact. I have no objection to another name, but by all means let it express the precise condition of the trees. I well remember that forty years since, in the neighbourhood of London, there was great difficulty in getting clean and healthy young trees from the nurseries, of the Golden Pippin; and the Ribston was then said to be following the fate of the Pippin. I am decidedly of opinion that no gardener in Britain, be he ever so clever, can undertake to rear a full-sized healthy and prolific Golden Pippin. It is of no use arguing that the transference of *old* grafts, in an exhausted state, occasions it: such is not a fact as to our nurserymen, who almost invariably reserve the prunings of their young and luxuriant trees for the grafting period; and this they have done in many cases for more than a century. Now this, one might imagine, would cause a renewal, if anything would. About the fact of the wearing out I have no doubt whatever: come how it may, or by whatever name it is called, the old Golden Pippin is surely lost to us. I think that it is but fair to infer that the process of grafting commits an injury on the system of the tree, and one which, however small, is of an accumulative character—ultimately tending to break up the constitution of the tree. If such opinion be tenable, we have one clue to this wearing out of kinds; which have for a century or more undergone the process of grafting. The writer of the foot note at p. 256 of the *Scottish Gardener* for June, quotes some cases which seem quite confirmatory of this view of the matter.

I have been led to offer remarks on this head, which I had not anticipated; my purpose being rather to glance at fruits in general. As connected with Apples, how little advance has been made in late years as to new kinds; and this at first sight appears strange, seeing that hundreds are annually raised in one part or other of the kingdom. Shall we say that the culminating point has been attained as to quality and general character? Surely

this cannot for a moment be admitted; or if a fact, the Apple is the only thing stationary in gardens. But many a flower is "born to blush unseen," and so no doubt valuable Apples exist in various parts of the country, not sufficiently appreciated by their owners; and of which our nurserymen, as well as gardeners, are entirely ignorant. It is a pity but some means could be devised to get all such valuable fruits together; our pomological societies have done a good work in offering inducements to exhibitors, but the misfortune is, such inducements do not reach the majority; indeed, scarcely a third portion of the possessors of such fruits are aware of its existence. There is no class of men in a better position to collect evidence concerning hardy fruits than clergymen; and could they be persuaded to act in unison in collecting and carefully examining fruits, and transmitting the fruit of their labours to the Horticultural Society of London, much good might be effected.

I would here respectfully urge on amateurs the pleasure and interest derivable from raising seedling fruits as well as flowers; it is but making a bold beginning and sowing seeds annually, to command a source of much interest for many years. And now let us consider the Peach and Nectarine, and enquire if any advances have been made in culture, or new kinds. One of the chief points of advance in cultural matters with the Peach during the last half score years, is the extreme abhorrence in which all insect enemies are held. "No quarter" is the maxim now with all good gardeners; and to effect this, the fumigating pot or syringe is put early in requisition. But yet another sound doctrine, better recognised than formerly, the ripening of the wood. For my own part, having been writing about Peaches and Nectarines for the last thirty years, I have never ceased to inculcate this maxim, well knowing it to be the only safe basis to all other practices. To effect this as it should be, the modern gardener disbuds his trees in May and June, until he has few surplus shoots left for the winter pruner. This appears sharp practice to the remnant of a previous generation; and, indeed, so it would prove, if trees were allowed to become menageries as they were formerly. He, therefore, who will carry out high Peach culture, must lay his account with a thoroughly clean system, and, as a proper adjunct, a sound and enduring root action; then he may disbud until not a surplus shoot remains. With regard to kinds of Peaches and Nectarines, who can avoid astonishment, when he considers that we have just the same kinds to handle as our great-grandfathers possessed; — so little fresh blood introduced, that it is not worth naming. Royal George, Noblesse, Bellegarde, Teton de Venus — these certainly are the cream of the affair; to be sure, we have such a thing as the Walburton Admirable. In Nectarines, too: Elruge, Roman, Murry, Newington — names we have been familiar with from our youth. And here I pause to ask, how this happens? Why, since flowers of all kinds are so hybridised, that we cannot tell a Rhododendron from an Azalea, and

a *Gloxinia* from a *Sinningia*, &c.—why, I repeat, has the fruit affair remained stationary?

I may here be permitted to speak of Pears, and indeed from the great utility of some of them on the dessert table, they might fairly have claimed priority in this case. We have now a most respectable lot of Pears in this country, and there exists no reason why the dessert table should not be supplied from July to the succeeding April, with good melting fruit, such as would tempt an erratic schoolboy to break through a strong fence. But then we have also a host with fine names, so mighty euphonious, that little doubt exists of many thousands having been sold on the merits of the name. We have, however, gained nothing, I fear, on the score of safe fructification; our fancy Pears are in the main somewhat shy setters, but for this there seems no present help. How strange it appears, on a close consideration of these matters, that our continental friends, who take such immense pains in raising seedling Pears, should not for a moment turn their attention in a similar way to Apples. I heartily wish that they were once fairly "bitten" in this way; they would soon infuse fresh blood into our stock. Surely they do not consider them incurable.

Turn we now to the Plum family; and here, strange to say, we were all asleep, until our good Brother Jonathan gave us a fillip. But, I much fear, that we need in many instances, an American climate, as well as American Plums. We have the celebrated Cornish Broccoli of Penzance in our seedshops, but, what can the good folks at John o' Groats do with this excellent article? Still, there are some good kinds of Plums from America, which will succeed in most of our warmer counties with proper care; other kinds, indeed, are worth a trial, especially such as may be considered eligible for standards.

The question of stocks for trees has attracted some attention of late, and deservedly so. I strongly suspect that our descendants in the year 2000, will wonder why we, in these supposed intellectual times, should persist in blundering on with stocks, which are, at least, suspicious. Only behold the Apricot, budded for more than a century on a stock which appears to possess but a very moderate degree of affinity for such a companion; but its doom appears to be sealed in this respect. The dying-off of whole branches in this tree would seem to point to more than ordinary causes; but yet the Apricot cannot yet be said to be worn-out: but what has an Apricot to do with the Apple question? Plants differ, as do animals. And then what contradictory reports as to the use of the Quince stock for Pears! The whole stock question requires a close examination.

The misfortune is that this affair may not be settled in the closet; a whole series of experiments, well devised, ought to be entered on and conducted by some person thoroughly conversant with all fruit trees, their habits, &c.: but he should approach the question in a liberal

spirit, and as far as possible divested of prejudice. Now this is too much to expect from any individual, unless a man of affluence and leisure; it might fairly be considered a national affair. If one quarter of the interest which is manifested on behalf of flowers and choice plants was awarded to the subject, it would suffice; and who can consider the whole question of the well-being of fruits as of inferior importance to that of plants?

One course of practice would fairly deserve a trial, and that is to try the whole of our fruits on "their own bottoms," as it is termed, whether by cuttings or by layers. We are so hampered by the matter of stock through long usage, that we have seldom given a moment's consideration to any other course. In raising seedlings, it is of little use breeding at random; such is not the best practice with plants or with animals. Kinds notorious for high qualities should be selected; and whilst this is done, care must be had to infuse vigour of constitution; this might probably be effected by occasionally making use of those fruits not far removed from the wilding state. They should be reared with as little check as possible, and cultivated on good soils in order to produce strong constitutions; and planted where they are to remain, betimes, in imitation of nature. As for the dwarfing system in fruit trees, although of immense importance in small gardens, it may fairly be considered as having a tendency to shorten the life of the individual;—whether by the use of peculiar stocks, by root pruning, or by any other method: such, in the main, merely hasten the effects of age.

The raising seedling fruits cannot, of course, be considered a profitable speculation; nevertheless, in order to assist in the affair, portions of the young trees might be budded or grafted with well known profitable kinds; these would not interfere materially with the proving of the seedling itself, but would rather facilitate its bearing tendencies.

Since writing the above, I have received the *Gardeners' Chronicle* for June 6th, by which I am glad to see that the learned Editor is impressed with as strong opinions on the stock question as those here expressed. However supine the public may be at the present moment as to this most important matter, I feel persuaded that few years will elapse before the subject will be taken up in earnest. Would it not be an interesting feature in the gardens at Chiswick, where so much ability and experience could be brought to bear on the question?

SHANKING OF GRAPES.

BY MR A. CRAMB, THE GARDENS, TORTWORTH COURT, GLOUCESTER.

For many years past this has been an agitated subject, it has given rise to many more adverse opinions than can well be calculated, and continues up to the present time to be an engrossing ques-

tion. The subject has lately been discussed in the pages of the *Scottish Gardener* with considerable ability, although I do not feel justified in accepting all that has been said.

I do not revert to the subject with any degree of confidence, that my statements will convey to the mind of others, that amount of conviction which has taken possession of my own; neither do I wish to set up a dogmatical standard by affirming, that the enigma has been deciphered, or that any enunciation of mine will solve the dispute; what I propose to do is, merely to detail that course which has carried myself through safely, not in one but in numerous cases, and that too under conditions of a very dissimilar character. I have frequently been impressed when reading the various discussions on the subject, that the views of many of the writers have been pushed beyond the limits of real facts in several instances, for unless deduction accompany our enquiries, what appears to be truth will in numerous cases prove to be little more than an assemblage of fallacies, upon which it is impossible for us to build general principles, or in any way to apply them practically. It has always appeared to me that the operations of the garden cannot long be conducted satisfactorily without constantly having recourse to a mental process of this kind.

There is no denying the fact that difficulties are often overcome, and intricate points are carried successfully, unaccompanied by anything like a correct knowledge of first principles, to give a just conception of what is necessary to be done. In reasoning upon this process, we can only say that some minds are so constituted as to have a law of their own, without being obliged to go through the usual course of investigation and reasoning.

The affirmation has often been repeated, that Grape shanking is intimately, if not entirely connected with impurities in the air of the house—a point which I have never been able to admit, nor do I think the argument carries much weight with it. The origin of the disease, must, I believe, be sought for in the roots destroyed by the action of surplus water in the border; at least I have never known shanking to occur where water was not allowed to accumulate in excess. Although vegetation cannot go on without water, not depending so much upon its own elements, as upon its agency in reducing and conveying to the system of the plant foreign matter of nutrition, stagnant water from whatever source, has quite a contrary effect, and is never under any condition suited to nourish plants, owing to its deficiency of carbonic acid, and the different alkalies.

From its decomposing agency the extreme points of the roots are the first to suffer, from the fact that they are principally composed of nitrogen, the very meaning of which is a negation of life. Those absorbing points, or what are sometimes called spongelets, that survive, can only maintain a sluggish circulation, hence growth is proportionably arrested, and the result is a prostration of vitality.

Grape Vines so circumstanced do not always give evidence of debility when forcing begins, for at first the buds may push strongly, and this activity continue till the young shoots are three or four inches long. When the leaves gradually begin to lose colour, the bunches take a stunted form, scorching shows itself, and in proportion to the force of solar heat, the effects of a feeble circulation of the sap becomes more apparent. This is not an ideal affair, it is a fact of stern reality; so to persons unacquainted with such an occurrence, they feel surprised, puzzled, and cannot by any means understand what has taken place, that so thoroughly deranges the vegetable mechanism. But the question may be answered in a very simple form—the young growths have to a great extent been living upon the vitals of the plant, or perhaps, in words more expressive, consuming the organised matter prepared by the leaves during the preceding year. A person placed in such a condition, will at once advert to remedial measures, which are to a great extent those employed by the exotic plant propagator. The night temperature should average from 40° to 50° , and that of the day from 55° to 60° ; and to keep it within these limits, slight shading will be necessary. The air of the house should be changed as seldom as is consistent with the health of the Vines, to prevent as far as possible the abstraction of moisture from the leaves, by perspiration, and this exhaustive power is additionally decreased by keeping the atmosphere highly charged with vapour.

Having applied these measures, attention must next be directed to the roots, which are the vital and moving power, and it is an acknowledged axiom, that under any condition, bottom heat is just as necessary as top heat, but in the present instance its application becomes more imperative.

(To be continued.)

COMPARATIVE HORTICULTURE.

1.—THE CULTURE OF THE *RANUNCULUS* IN FRANCE.

Ranunculus Asiaticus.—This plant requires a soil, which is light, sweet, and fresh, and not containing many stones. By planting it in a free sandy soil, enriched with leaf mould, the greatest success is obtained. According to their quality, soils should be mixed with well-made compost if they are heavy, and with fresh loam if they are light. The more they are turned over and passed through the earth-screen, the better will they be adapted for the cultivation of the *Ranunculus*.

An eastern exposure is most favourable for this flower, nevertheless it succeeds well in an open situation; but when planted in winter it should be placed towards the south, in order to have early flowers.

When raised from seed, it is necessary to gather the seeds in dry weather from semi-double plants, with strong and tall stalks, having broad thick rounded petals of a distinct and vivid colour. The stalks are cut, formed into bundles, and hung up for a couple of weeks or a month to complete the maturity of the seed. We may sow it at once, or keep it in paper bags for three or four years. New seeds do not rise so well as those a year old. The period of sowing is to be determined by the temperature. In the north it is usual to sow in spring in the open ground; in other climates, at the end of summer. With seed pans one may operate at any time.

To prepare for sowing, the surface soil to the depth of two or three inches should be passed through a fine screen, and well put together. The heads of the *Ranunculuses* are taken and rubbed with the hands, in order to detach the seeds; and the latter are sown rather thinly if the greater part of them have a well marked grain in the centre—otherwise, they ought to be sown thickly. The seeds are lightly pressed down with the hand or the back of a trowel, and a slight covering of the same earth, of one-fifth of inch thick, and passed through a fine sieve, is placed over the whole. In seed pans they are sown in the same way, but they are covered with moss. The pans are watered, placed in an eastern exposure, and are set on plants raised two or three feet above the ground to put them beyond the reach of insects. When the sowing has been in the open ground, it is beneficial to place over the beds a wire-netting, or slender branches crossing each other. The ground should be kept fresh, and often weeded. Slugs should be guarded against. The seedlings appear in from thirty to fifty days, according to the temperature. When the young plants, which are called *Pucelles* (Maidens), acquire some strength, the netting or branches are removed, and if sown in spring they are treated like old plants. When the sowing takes place in the end of summer or in autumn, it is necessary, previously to the approach of frosts to form frames, rising three or four inches above the ground, on which straw mats are put, and doubled as the cold increases. It is also proper to put in the paths which surround the planks seven or eight inches of litter. The plants are uncovered as often as the weather permits. With these precautions the young plants will pass the winter in safety. If the seedlings, from autumn or spring sowings, are weak, the roots after the leaves are withered are left in the ground, but $2\frac{1}{2}$ inches of earth is added to the bed, and that covered with $1\frac{1}{2}$ inches of leaf mould. They are preserved from frost as in the first year.

When the autumn sowing has been well managed, some of the young plants bloom the following summer; but from that to the third year, all, at whatever time sown, show flowers. It is well to lift the plants of the first year, as they succeed better when transplanted into fresh soil. As they come into bloom, the best varieties

are marked, and the others pulled out. The fine plants are those which possess an elegantly cut foliage, a strong stem ascending at least 6 inches above the leaves, a corolla double, and exhibiting none of the organs of reproduction, of about $1\frac{3}{4}$ inches in diameter, and perfectly rounded. The petals, all a little arched in their surface, should be lightly applied the one over the other, on their convex side. They diminish by degrees from the circumference to the centre, where they close on each other so as to form a disk more or less plane or even lenticular, and of a brilliant tint, particularly in the rose or cherry-coloured corollas, called *Ranuncles a coeur vert*. The most esteemed flowers are selfs; but there are some very beautiful ones which are shaded with more lively tints, or flaked with various colours, pure and well defined.

Ranunculuses which have reached their full development are planted in autumn before the strong frosts, in the provinces where the winter is mild, or where the frosts last only 8 or 15 days at most, during which they are covered with a little litter or fern. Before planting, the beds are well prepared for several months. If the soil is not substantial, a portion of loam and a certain quantity of well-rotted vegetable manure is added. It is thoroughly worked by passing it through the earth-screen shortly before planting. After allowing it to consolidate, longitudinal and transverse lines are traced with a cord as for Hyacinths. The distance between the lines depends on the strength of the roots, and the temperature of the place. In certain provinces a *Ranunculus* covers 6 inches of ground, in others, as in the neighbourhood of Paris, $4\frac{1}{2}$ or even $3\frac{3}{4}$ inches. The distance ought to be such that the earth is covered with the leaves in order to preserve its moisture; and yet so that the foliage of one plant should not over-lie that of others, as that would be injurious to growth. It is requisite to plant the roots of seedlings at least one inch wider than those of older double varieties, as the former are more vigorous, and give out larger and more numerous leaves. When the lines on the bed are traced, the planter places at the points of intersection a root with its crown upwards, holding it loosely between the fingers, which cover it and go beyond it in order to prevent the roots from being broken. They are thrust down to the depth of about $2\frac{1}{2}$ inches. If they are planted in spring, it is useful to steep them 12 hours in a mixture of soot and water, as its bitterness keeps off insects. When the roots of seedlings are planted in mixture, or when they are arranged in families, that is, when all the plants of the same variety are kept together, it is sufficient, as in the case of Anemones, to form drills $1\frac{1}{2}$ inches deep. If all the roots are strong they are placed at equal distances at the bottom of the drill, but they are sunk only so far as that the eyes are at the level of the surface. If there are great and small roots, the strong roots may be placed at the distance of $1\frac{1}{2}$ to $2\frac{1}{2}$ inches, and the weak ones between them. Then the drills

are filled up, the surface is lightly raked, and a layer of compost of an inch or so in thickness is spread over the bed.

Ranunculuses planted before winter should be sheltered from frosts in the same way as seedlings. If they are placed in the ground during fine weather in January or February, and new or strong frosts supervene, the state of the roots should direct the cultivator. Thus, if the frost comes on within a fortnight of the planting, the roots as yet slightly swelled, have nothing to fear; but if, when the bud begins to elongate they are attacked by the cold, they are lost. They must be sheltered, and as soon as the danger is past, uncovered.

After the leaves appear Ranunculuses require only such weeding, hoeing, and watering as are necessary to preserve the soil in a moist and soft condition till the time of flowering. Continued waterings are given in dry weather. A watering-pot with a fine rose should be employed in order not to bend down the flowers or batter the earth. From the beginning of June the waterings take place in the evening, and they are suspended as soon as blooming season is over. The duration and beauty of the flowers depend on the temperature; a burning sun by accelerating the growth prevents their full development, and continuance. Ranunculuses planted in autumn bloom at an earlier period, and in cooler weather, and consequently are larger, finer, with more distinct colours, and of greater duration than those planted in the end of winter. The roots too are better fed. It is essential therefore to plant in autumn.

As soon as the leaves are withered, the plants are lifted, the leaves and stems are removed, and the roots placed in a sieve or open basket, are washed by being repeatedly immersed in water. They are then spread out in an airy place, but not in the sun; and upon being thoroughly dried, are deposited in drawers or paper bags. Like Anemones, they can be thus preserved a whole year without being planted.

Ranunculus africanus.—This species differs from the preceding in its fewer and larger leaves, which are of a darker green, and less decomposed, and in its stronger stem surmounted by a larger and very double proliferous flower. There are one single and four double varieties, viz., *R. Pivoine rouge* or *Rouma* (red Peony *Ranunculus*); the *Seraphique d'Alger* of a Jonquil colour; the *Souci doré* or *Merveilleuse* (golden Marygold), colour of the Marygold with green heart; and the *Turban doré* (golden turban) red, streaked with yellow. [These are all the turbans of the English catalogues.] They require the same culture, but they are less sensitive to frost. In compost not too humid, they may be planted in the beginning of autumn, and then only they attain to their full dimensions, and give double flowers. If the soil in which they pass the winter is moist, they return to their original red colour. Sometimes the *Seraphiques* and *Merveilluses* are half red, and the golden *Turbans* want their yellow variegation.—*Le Bon Jardinier*, 1857.

THE BLACK BARBAROSSA GRAPE.

I HAVE read with much interest the discussion which has been going on in the pages of the *Scottish Gardener* between Mr Cramb and Mr Thomson respecting the qualities of the Black Barbarossa Grape, but until Mr Thomson threw out the idea (see p. 228) of others communicating what they know, "*pro* and *con*," respecting this variety, I had no thought of joining them, or of taking any part whatever in the controversy; but when I read that remark above alluded to, I at once decided to relate my experience upon it, as it would be one opinion more to assist in deciding the merits of the Grape in question.

After seeing so much in the papers, in the shape of advertisements, I formed a very high opinion of it. Soon after this, my employer being out on a visit saw the Barbarossa in fruit. When he came home he spoke very highly of this "new Grape," at the same time informing me where I could see it for myself. I lost no time in going to see the Grape "that didn't know to shank." The Vine, for there was but one, had one bunch upon it; the bunch was a very fine one, well shouldered, and as black as coal; whether any had been cut from the Vine, or whether that was the only bunch that had been produced, I did not stay to enquire, for I was so enraptured by its noble appearance, that I forgot to ask any thing about its bearing properties. It was enough; I was decided. I at once procured two young Vines, and planted them at one end of a house, the other part of which was planted with Black Hamburgs. This is the fourth summer since they were planted; the Vines are strong and in the best of health, and reach to the top of the rafters. The wood was well ripened in the autumn, and pruned on the close spur system. They were turned out for the winter, but protected from rain and snow. The Hamburgs in the same house are of the same age, grow in the same border, have been pruned and treated in exactly the same manner. All the Vines were re-introduced into the house early in May. Now, all the Hamburgs are showing fruit, but the far-famed Barbarossa has nothing but leaves. It was just the same last year, which was the first season that I attempted to fruit any of them. In fact, this "new Grape" is a complete failure, not having as yet produced a single bunch of fruit.

Am I justified then in joining Mr Cramb in calling it a "shy bearer?" Whether I am justified or not, such is the conclusion to which I have come concerning it. And, consequently, I have, with Mr Cramb, "meddled wi' it," by working upon it a sort more worthy. Here the trial of the Barbarossa has ended. It has been fairly balanced and found wanting, condemned, and the sentence executed.

Being in conversation the other day with a Grape grower of this neighbourhood, I said, among other things—"What do you think of

the Black Barbarossa?" "Oh!" said he, it is good for nought, it is so shy;" adding "I have worked mine." "But it is a good keeper," I replied. "Yes, when you can get it to keep," was his answer, "and then it is not worth eating!" Here, then, is another opinion upon this "new Grape." To another successful cultivator of the Grape, who not unfrequently carries medals from Regent Street, I put the question—"Do you grow the Barbarossa?" "No!" was the reply, "I never thought that it was good for anything, and from what I see and hear, the opinion I formed was right. I never had a plant on the premises, nor do I intend to have." The gardener in question told me where he had seen it, which enabled him to form his opinion. Suffice it then, to say, that the Vine on which I saw the first noble bunch of fruit, has been beheaded, and the root that supplied it with nourishment now feeds one of the St. Peter's varieties. I need not say more—these things speak sufficiently loud, and I readily cast my opinion in Mr Cramb's scale, whether that side becomes the heaviest or not.

The want of colouring matter in the foliage is a true characteristic, every leaf, in the autumn, having the brown tint mentioned by Mr C. The wood also has a peculiar red tint, distinct from any other sort with which I am acquainted.

T. J., Manchester.

OPEN GUTTERS IN FORCING HOUSES.

BY MR THOMSON, DALKEITH PARK, DALKEITH.

UNDER this heading, in the June number of the *Scottish Gardener*, your correspondent "Daisy," who seems to have been in a very "thistly" humour when he penned his article, conjures up a host of absurd objections to the system of supplying moisture to the atmosphere of hothouses recommended by me in your March number. On that occasion I made myself so clearly understood, that many gardeners and nurserymen have fixed the gutters as described by me, and find them answer admirably; but I fear "Daisy's" blindness is of so hopeless a character, and the result of a determination not to see, that nothing I can add to my previous communication, will be of service to him.

"Daisy" seems to infer that I claim to be considered the inventor of open gutters, for he says, "there is nothing new in having open gutters"—did I say there was? Again, he says, "it is also described by M'Intosh, in his *Book of the Garden*." Never having seen that book till I read "Daisy's" reference to it, I was ignorant of what it contained, and now I find that while an open gutter in connection with pipes is spoken of, it is described as having a flow and return from one and the same end, which certainly would not act well, and is anything but what I recommended. Again, we are informed that "where they would be required for bottom heat and

moisture they would become receptacles for all matters that might fall from the bed above them." I never thought of recommending them for such situations. It would appear that "falling leaves and other matters" must abound to an unheard of extent in the houses under "Daisy's" care, if they can complete the "choking process" of pipes containing from 300 to 600 gallons of water in "two or three years."

Allow me to close by saying, that if "Daisy" will quit his verdant valley for a day, and honour me with a visit, I will show him how the open gutters can be attached to pipes that are "on an incline," and "on different levels," and wherein the water is as pure and limpid as that on his own petals at early dawn.

TRIAL AND EXECUTION OF AURICULAS.

[THE following *jeu d'esprit*, from the lively pen of M. Alphonse Karr, is a satire on the pedantries of the floral canon laws. It will be understood that the enraged florist is a Frenchman.]

One of the flowers, recognised as flowers by amateurs, is the Auricula. Happy the flowers that have the luck to escape botanists and florists! They do not receive ridiculous names; they are not tormented, annoyed, subjected to absurd requirements; they bloom in peace.

Botanists demand that an Auricula be yellow; if it presents itself in any other colour, it is a monster, like a double Rose.

Amateurs allow it to wear any colour it pleases; but that is only an appearance of liberty. I once saw an amateur in a fury. He had received Auriculas from I know not what country; and he had cultivated them with care. He had tortured them after the fashion of florists; he had pinched them in water and sunshine, and in soil too, by placing them in pots. As I entered his premises, he was tearing them up by the roots, and crushing them under his feet. I understood from his broken words, that the Auriculas were suffering vengeance for not having fulfilled the conditions required and expected from them.

I ventured to put a question or two to ascertain the state of matters, and to learn what horrible crime had been committed by the poor flowers, which appeared to me to be arrayed in the richest colours, and to breathe a captivating sweetness. He continued the execution, pronouncing judgment on each, and stating the grounds of its condemnation, before crushing it under his feet. Along with me, you may draw instructive consequences as to the duties of Auriculas towards man, and the results to them if they take upon them to transgress these duties.

He caught up a flower of the most beautiful velvety blue. Its stalk is too short, said he, and he smashed it. To this succeeded one of a rich downy brown, with a circle of white in the centre, called

the eye. Its stem is too tall: it was smashed. An orange velvet: the flower is not exactly round; smashed. A deep purple velvet: the truss has only eight flowers, it ought to have twelve; smashed. A soft silky olive: the eye is dabbled (that is, has a slight tinge of olive); smashed. A velvety yellow: the eye is not a third of the circumference of the flower, which is the least that it can have: a friend of mine requires that it should be the half; I am indulgent, but I cannot allow this; smashed. A pale soft violet: the eye is not exactly round; smashed. A deep downy violet: ah! what are you doing here? You are pin-throated. That is fine to be sure!

Here I interrupted the judge and executioner to ask an explanation. Amateurs call Auriculas *pin-throated* when the pistil projects beyond the stamens. It is indispensable that the stamens should alone appear. It is a very grave matter when the contrary happens; for then, whatever be the colour or splendour of the flower, no true amateur would retain it in his possession.

A hundred fine flowers were thus sacrificed before my eyes. I begged that he would make me a present of them; but my request was rejected. "Not at all: I will give you some others." "But I like these very much." "Ah, you are joking!" "By no means." "Well, but I cannot give you them. I would not have such Auriculas go from my collection. If it was known that I had given them, either my collection or my friendship would be called in question." He was inflexible.

Do not suppose that I have invented aught, or exaggerated at all. Find a fancier of Auriculas, and read him this part of my letter. I tell you beforehand that he will not smile. He will find nothing laughable in this: he will tell you that his brother-florist was in the right; perhaps he will only think him a little too indulgent. For the rest, my friend, this is a chapter to add to the rights of man. Meanwhile you know what you ought to expect from Auriculas; and I trust you will be able to make yourself respected.—*Voyage Autour de Mon Jardin*, Lettre XXV.

HOT WATER CIRCULATION.

I HAVE been considerably instructed by some of the communications on heating horticultural buildings which have recently appeared in your pages; and being alive to the importance and necessity of a thorough knowledge of all such matters, I would strongly urge all my compeers to make themselves well acquainted not only with the practical details of heating, but, most of all, with the philosophy thereof.

That system of teaching which brings me face to face with stern facts may be all very well in its way, but I confess that I am seldom satisfied without knowing a little about the how, the why, and the wherefore, especially in matters that concern my profession. It is

not enough to know that water, when heated, circulates in hot-water pipes, as they are generally fixed; and I hope I shall be excused for wanting to know if the assertion of Mr Anderson in your last issue be correct, when he says:—"We have *little or no* circulation in the pipes till the water boils in the boiler." Mr A. will pardon me when I say that I was quite startled when I met with this doctrine, contrary as it is to all that I had previously learned and believed; for verily it had long been my firm belief that the circulation of the water commenced immediately the particles of water were expanded and their specific gravity lessened by heat, and that such took place long before the water could boil in the boiler. In short, I said to myself—Mr A. ignores or nearly ignores this principle altogether, and has surely a very funny boiler, for it had formerly been a matter settled with me that if the boiler and pipes were properly balanced there was no such thing as boiling in the boiler at all, and that such was not at all necessary to a most rapid circulation.

Mr Thomson, in your last issue, says that he caused 500 gallons of water to pass through one of his boilers in 40 minutes from the time the fire was applied. He would very much gratify, and perhaps instruct me, if he would say whether, with this rapid work to commence with, he considered there was no circulation in the pipes till the water boiled in the boiler? or whether the water ever boiled at all?

AN OLD STOKER.

Since the above was in type, we have received the following from Mr Anderson, Meadowbank:—

"In perusing my article in your June number, under the heading of 'Heating of Horticultural Buildings,' I am sorry to find a paragraph towards the close reading thus:—'But as we have *little or no* circulation in the pipes till the water boils in the boiler,' &c. What I intended to convey was—*And as we have less or more circulation in the pipes before the water even boils in the boiler,* &c. I probably ought to have been a little more plain and definite with my ideas; for, instead of '*little or no* circulation,' the moment the particles of water in the boiler becomes partially heated, they begin to ascend and circulate, and will go on to do so, so long as the specific gravity of the water is kept on the scale of graduation; for, as there is no circulation when the water is cold, so also would there be little or none were it possible to have the whole water boiling in both boiler and pipes at one and the same time. This gradual circulation is the beauty of hot water, and where the apparatus for its circulation is properly constructed, there is nothing more kindly, nothing more efficient, nothing I know of that can be rendered nearer a natural temperature.

Houses heated by steam, for example, besides the danger incurred by a partial neglect, are objectionable from the fact that they derive

no benefit until the water boils in the boiler, and therefore steam is entirely superseded by the far easier managed and more congenial system of hot water."

NOTES ON AZALEAS.

BY MR J. ANDERSON, GARDENER, MEADOW BANK, UDDINGSTONE.

The best of the Azalea flowering season is past, and what a glorious display—what a variety of contrast have we in this beautiful tribe of Chinese plants! One might readily suppose that even the granite feelings of Commissioner Yeh—John Chinaman though he be—would be somewhat softened in beholding such a beautiful class indigenous to his soil.

Nothing repays the attention of the cultivator more; nothing pleases the public better than towering pyramids, densely flowered, of this choice exotic. No plant whatsoever takes less general attention, and, therefore, no collection, however small, should be without them. But there are some varieties that give better satisfaction than others, and with such, in the meantime, I am going to deal.

Among the older varieties we have—

Triumphans—Rose colour, richly spotted; fine habit, and free bloomer;—requires strong heat to set its buds.

* **Coronata**—Brilliant rosy red; one of the most useful Azaleas in cultivation; good forcer; very distinct, and can also be kept in flower almost as long as any other variety extant.

* **Decora**.—Rich violet rose, beautifully marked, rather deficient in shape, but exceedingly showy and attractive.

* **Fielder's**.—White, a very large bold flower; white, with greenish marking, fine shape, robust habit, and very free bloomer.

Optima.—Large, scarlet, fine form, and well marked, and still retains a high place among so many fine new varieties.

Lateritia alba.—This and a variety named *Gledstanesii*, appear to me to be the same; white, striped with red, fine form; good late variety.

* **Rosea punctata** is very closely allied to **Triumphans**; a shade lighter in colour, and rather more compact in habit.

* **Smithii splendens** comes pretty much like **Optima**; scarcely so large in flower, but a better habit.

* **Præstantissima**.—Light orange red, densely spotted, free bloomer, and late.

Broughtonia.—Light orange scarlet, finely spotted; rather straggling habit.

Lateritia.—Brick red, good form, and distinct.

Lateritia superba.—Fine dark scarlet, free habit and bloomer; good late variety.

Gledstanesii excelsa.—Violet rose, beautiful shape, flowers small, but free bloomer.

Grenvillei.—Orange scarlet, good shape, free bloomer, and very attractive.

* Indica alba.—White, deficient in form, but pure in colour; very free bloomer.

The foregoing will be found to have something about them which will please the cultivator more or less, independent of the following newer, and certainly most admirable varieties:—

* Perryana.—Orange scarlet; exquisite form; great substance; just wants deeper marking to be one of the very best in cultivation.

* Rubella Supreme.—Rosy crimson; superb form; rich marking; one of the best of its class.

* Iveryana.—Large white, striped with rose; first-rate form and substance; will not be easily surpassed.

* Criterion.—Large salmon pink, edged with creamy white; splendid form; free habit and bloomer; superb.

This and Perryana ought not to be forced, to be seen in their true characters.

Mrs Fry.—Rosy purple, distinct, and attractive; a little deficient in form.

Murryana.—Bright rose; large and fine form; very distinct.

* Rosalie.—Rosy pink; fine habit and very free bloomer; rather small as a flower, but very telling.

Stanleyana.—Rosy scarlet; exquisite form, free habit, and altogether fine.

Variegata.—Salmon pink, with white margin; something of the order of Criterion, but much inferior.

* Juliana.—Orange crimson; good form and habit; promises very well.

Chelsonii.—This somewhat resembles Juliana, although it rather approaches to scarlet, robust habit, and fine.

Beauty of Europe.—Pink striped with carmine, free bloomer, distinct and showy.

* Bealii.—Light carmine, striped or white, quite different in foliage to any other variety; straggling habit, but very distinct.

Crispiflora.—Rich rosy purple, frilled at the edges, quite distinct, good form, deficient in marking, but one of the best late varieties.

* Dilecta.—Deep rose, very large flower, and very attractive, although rather deficient in form.

* Formosissima.—White striped with rose, very free bloomer, dwarf habit, and fine.

Duke of Wellington.—Large scarlet, well marked, not so fine in form, but very showy.

Glory of Sunning Hill.—Rich pink, good form and habit, semi-double, admirable.

* Magnifica Plena.—Purplish rose, very large and very showy, semi-double.

* *Semi-duplex maculata*.—Dark rose, fine form, distinct and free bloomer, semi-double.

I have placed an asterisk at those varieties we have bloomed very fine here this season ; and I may also add, that however thick a round bush may be flowered, it has never the same ornamental appearance as those trained after the pyramidal system.

THE BARBAROSSA GRAPE.

[Since the notice of this Grape in the previous part of this number was printed, the work of Comte Odart on Vines has come into our hands. Believing that what he says on this fruit may be of interest to our readers, we hasten to give an abridged translation of the following account of it. It will be seen that it requires a warm climate, and that it should be grown along with Muscats, and not Black Hamburgs. It may also be doubted whether the genuine sort is yet in Britain.]

Uva Barbarossa (Piemont); *Rossea* (Comte de Nice); *Brizzola* (vineyards of Liguria).

This Vine, if not the most remarkable, is at least one of the most esteemed, and the most cultivated in the South of France, and in Italy. Its fruit is equally valued for the table on account of their fine flavour, beautiful colour, and long preservation, and for the press because of the excellent quality of the wine produced from it. In a long article extracted from the elegant work of Comte Galesio, *The Pomona Italiana*, the merit of this Vine is described in these terms:—"From its vintage a beverage, light, agreeable, and refreshing, and at the same time spirituous, is obtained the same year it is made; but in order to attain to all its good qualities it is needful that the liquor come from well ripened fruit. This ripeness, which is indispensable to the quality of all wines, is, without doubt, easily obtained in the south of France, and above all, in Italy, but it is a little more difficult in our climate" (Touraine). The author adds: "This is the king of Grapes for the table; it unites in itself all that is desirable in table fruit, and none can be compared to the Barbarossa, neither the *Uva regina* of the Tuscans, &c., nor the *Chasselas* of the French." In this I dissent from Comte Galesio. The *Chasselas*, in Touraine, is greatly superior to the Barbarossa. The latter does not acquire the delicate sugary flavour of the former, and is not crispy like it. The article, above referred to, is incomplete in that it does not explain the differences of this sort from others of the same name of which I now proceed to speak. For example, the leaves of the true Barbarossa are larger than those of the *Grec rouge* to which the name Barbarossa is often given in the south. The leaves of the true sort are cottony underneath, while the leaves of the others are only downy along the nerves. I may add that the bunches of the

Barbarossa are of moderate size, suspended on a long and slender stalk, and furnished with berries which are slightly oblong, and become almost round when ripe; whereas the other has enormous bunches composed of berries of double the size, very closely put together, and very round. Though Micheli Trinci, an esteemed Italian writer on Vines has said, *Acinis roseo colore fulgentibus*—the berries fulgent with a rose colour—this colour is not at all brilliant, for the skin of the berry is covered with a hoar or bloom which very much deadens the splendour.

[Comte Odart then speaks of the *Barbarossa Verdone*, an Italian Grape, which does not reach maturity in the centre of France. He mentions some others generally called *Grecs*, particularly one which is named *Barbaroux* in Languedoc, and at Paris, Gros Gromier du Cantal. Of the latter he remarks]

I know a gardener who sold a small rooted plant of it a year old, for 15 francs, which was fifteen times too dear, for if its bunches are beautiful and numerous, the quality of the fruit is mediocre, both for the table and the winepress. Its leaves are very much cut, and are glazed on the upper surface. Its voluminous bunches are of a beautiful red tint.

Comte Odart adds—I have received the *Grec Rose* from Corsica, under the name of *Barbarino*. It is very tardy in coming into bearing. I have had it for ten years, and only this year (1848) has it displayed its magnificent bunches, which will never ripen in the open air. Like the *Grec rouge*, the leaves are small and deeply cut, but somewhat cottony on the under surface, which last is a noticeable distinction.—*Ampelographie Universelle*, pp. 497—500.

GARDEN MEMORANDA.—MR TURNER'S ROYAL NURSERY, SLOUGH.

To the lover of florist flowers, nothing can be more interesting than a visit to this nursery. On the occasion of a recent visit we saw many new plants of rare excellence, flowered for the first time, at Slough, some of them seedlings of Mr Turner's own raising, and others' importations, a brief description of which may not be uninteresting to those readers of the *Scottish Gardener* who take an interest in florist flowers.

A seedling Pansy, named *Cyclops*, that may be regarded as an unusual fine variety, yellow ground, with a rich dark margin, good form, and fine solid eye. We also saw some fine seedling *Pelargoniums* to be sent out in the autumn, and among them we were struck with *Etna*, a very bright orange scarlet, with dark upper petals and fine habit; *Rose Celestial*, soft lilac rose, with a fine dark blotch and free habit; *Imperatrice*, a large and showy variety, not quite first-rate in form, still well worth having in a collection; *Rosy Gem*, a distinct, deep, rose-coloured variety, very attractive; *Evangeline*, a painted deep rose flower, that will be very useful

among the fancy seedling Pelargoniums; Acme, a variety in the way of Evening Star, will be a great acquisition in this class; Mrs Turner, this is a beautiful variety of a soft rose colour, with a pure white throat, which will be a great acquisition to any collection; Rosabella, a flower much in the way of Jenny Lind, but a great improvement on that good old variety. Among the newer kinds of Pelargoniums lately introduced, we noticed some very fine and distinct sorts, viz., General Williams, King of Scarlets, Matilda, Marvellous, Viola, Prince of Prussia, Mr Hoyle, Mr Beck, Conspicuum, and Spotted Gem—the last four are very distinct and beautifully spotted varieties.

Among the newly introduced striped Petunias, we noticed as being very fine, Inimitable, light purple, with a broad margin of white, very distinct; Irvan Schumberger, rosy, carmine, striped; Anton Rochel, reddish, purple, striped throat; Madame Plantamour, white, striped with amaranth; Madame Kreitzberg, white, striped with lilac; Springfield, purple, very large and showy.

Most of the new Verbenas were in flower, and we noticed as being really good Prince of Oude, Rosy Gem, Crimson King, Sims Reeves, Sir J. Paxton, Evening Star, Prince of Wales, Lady Palmerston.

Mr T. holds a large stock of shrubby Calceolarias, of which the following are very showy, distinct varieties,—Gem, Prince of Orange, Comet, Golden Chain, Zouave, Masterpiece, Surprise, Yellow Dwarf, Hawk, Lady Middleton, and Aurea Floribunda.

J. DOWNIE.

EXHIBITION OF THE HORTICULTURAL SOCIETY OF LONDON, AT CHISWICK—JUNE 3D & 4TH.

(From a Correspondent.)

For months past the Horticultural world has, in various ways, been directed forward to this great fete, which more or less stood connected with the rescue of this Society from that extinction with which for some time past it has been threatened, and which was hoped to raise it from the degenerate state into which it had sunk. To all true lovers of progressive gardening it must surely be an object of sincere desire that some Society should exist in this great nation, to foster and stimulate the science of horticulture. And to this end, nothing perhaps is more wanting than a garden where living examples of superior cultivation can be shown, and in which practical gardening should be carried on in first-rate style, and to which the public could resort to learn instead of to ridicule and jest.

This old ship then has been manned afresh. New blood has been infused into the various departments of the Society. Great accessions of a different order of fellows have been added as its supporters

Practical gardeners find their seats in the council, and a first-rate man has been placed at the helm of affairs in the gardens themselves. All things seem to bid fair to place the Society in a respectable and useful position, and worthy of its great name.

In passing on to give a few general remarks about the exhibition on this occasion, we cannot refrain from just adverting to the rapidity and good taste with which Mr M'Ewen has in so short a time altered and improved many of the chief features in the gardens, and more especially is great credit due to Mr M'Ewen when it must be borne in mind that all such had to be carried on in the midst of more extensive preparations for this great show than was ever required here before, and that too after these exhibitions had been given up for a season, and the gardens had fallen into an ill-conditioned state. In what has been termed the American ground especially, a very great improvement indeed has been effected, and although the work had been so recently accomplished, it had an established and finished appearance which we really did not expect to find. At the same time we must beg to dissent entirely from the idea which the editor of the *Gardeners' Chronicle* tries to convey with the following brilliant dash of his pen, respecting the effect of the display of American plants in this garden this season, as compared with other exhibitions under canvas:—"Rhododendrons and Azaleas were glowing with crimson, and yellow, and purple, and white in all directions, and left no room for doubt on the part of the most indifferent spectator, that if American plants are to be seen in perfection, it is not by crowding them under canvas so as to reduce their beauty to the level of a *childish peepshow*, but by displaying them in the free air to the bright sun, arranged as they would be where nature is the artist." We profess not to have been an indifferent spectator of the Rhododendrons at Chiswick on this occasion, but certainly we saw no display which could warrant such language as the above, and while we found quite as much, nay more, than might be expected under the circumstances, we hold that it is an unfair representation of matters as they really are. Has the editor of the *Chronicle* seen the Americans in the Royal Botanic Gardens in the Regent's Park? Those who have seen both displays will agree that such one-sided representations are the worst possible support for the affairs of any society, and shows the necessity for a truthful and disinterested organ to represent such matters. It may be contended, without the slightest reflection on the American ground at Chiswick, that it would not bear comparison with the display "under canvas," as seen in the Gardens of the Royal Botanic for some years past, and more especially this season. "Save us from our friends."

The large conservatory had been entirely emptied of its old residents, and converted into a grand exhibition hall, for Orchids, Ferns, Lycopods, and plants with variegated and remarkable foliage, and surely a more superbly managed and valuable lot of plants than

those which occupied this house could scarcely be imagined. Groups of plants of remarkable foliage were extremely fine, and the prizes well contested by Messrs Veitch and Parker, as at the May show of the Crystal Palace. Mr Parker's group of Ferns was admitted by all to be the most choice and superbly managed ever before staged at any of these metropolitan shows. The Orchids too, were fine, especially the collections of Messrs Veitch and Mr Rucker. To give the names of the principal things exhibited on this occasion, as we intended, would be found to take up so much of our space, that we will merely make reference to the leading collections and features of the exhibition as a whole. In the conservatory too, were displayed the new and rare things, which to a large extent, were the same as reported of the May show in the Regent's Park.

In a tent of immense length, 100 yards, on the lawn at the east end of the conservatory, were exhibited the fruit, miscellaneous collections of stove and greenhouse plants, *Ericas*, *Azaleas*, &c., which as a whole was very effective, and the individual collections very fine. More fruit than was contributed was looked for, and as it was scattered over a very large table, the general appearance of the fruit was deficient, although when inspected there was a considerable quantity of good fruits, especially Grapes. Those from Mr Frost and Mr Fleming were fine examples of Grape growing.

In another tent running parallel with the large one just referred to were exhibited *Roses*, *Rhododendrons*, and *Azaleas*, in circular beds, with raised verges of grass, and the surface of the beds covered with moss. In this way the round groups of plants were very effective, and the tent had an easy and elegant appearance. The only disadvantage which this mode of exhibiting in low round groups has, is that when the tent is crowded, the plants are not so well seen by the outside spectators as when more elevated. The *Roses* in this tent were fine examples of what can be accomplished by the great nursery growers around the metropolis, and the amateurs scarcely fell short of their nursery rivals. The *Rhododendrons* contributed by Mr Standish and Mr Noble were very splendid, both as regards the superiority of varieties and the fine heads of bloom. Surely they were not brought to such perfection under a hot sun.

Pelargoniums were both numerous and well grown, but as they were broken up into different tents, they did not have so imposing an effect as when placed all together, and some of the collections were very much too crowded. A beautiful collection of French spotted sorts were exhibited by Mr Turner. These varieties are a great acquisition for decorative purposes.

What most to be wondered at is, that in the very centre of one of the greatest vegetable growing localities in the world, this department was a complete failure. They were scanty in number, and not so good as we have seen at a cottager's show.

Taken as a whole, the exhibition was all that could be wished. But the question which may fairly be asked, will another season

witness such a success with the prizes offered this season? It is to be feared that it will not. What is it that always secures such a vast amount of fruit at the Regent's Park every season, and such a vast number of plants, &c., at the Crystal Palace? This assuredly has its answer in the fact that the prizes are liberal, and all other things being equal, the greatest prizes will insure the best show of things.

The exhibition of all sorts of garden machinery, implements, hothouses, and boilers, &c., contributed much to the interest of this meeting; and so numerous were the examples of hothouse models, boilers, tents, vases, stands, and all sorts of garden tools, &c., that to notice them in detail would fill a whole number. To all who take an interest in this department, we say buy a catalogue.

CANKER IN FRUIT TREES, &c.*

WE intended to notice this pamphlet by Mr Pearson; but the following extract from the *Gardeners' Chronicle* expresses our sentiments so fully, and so much better than we could, that we copy it entire. From the initials we understand it to be by the Rev. Mr Berkley, the great cryptogamist, and the author of the interesting papers on the Pathology of Plants in the *Chronicle*. To what he says, we have only to add that it does not seem proved, as Mr Pearson affirms, or assumes, that Canker in Apple and Pear trees, and Gumming in Peach trees, are one and the same disease.—ED. S. G.

A small pamphlet has lately been published by Mr John Pearson, professing to explain the certain cause of canker in fruit trees, and at the same time its certain prevention. The views which it holds forth, though not absolutely new, are worth attention, as they tend to show the folly of expecting that, without care, plants like the Peach and Apricot, which come from far warmer countries than our own, can bear uninjured the constant wear and tear of our changeable climate, in addition to all the untoward circumstances under which they are placed by bad cultivation. Mr Pearson's notion is that the buds of the half-ripened wood are affected by the alternations of wet and cold weather, with heat and drought, during our changeable and often ungenial summers; and he has attempted to prove this by causing artificially a stream of water to pass over denuded buds with intervals of rest. By these means he has induced undoubted canker or gum, and he therefore concludes that such alternations are the cause of the disease in general, and he only way of prevention is to protect the trees, especially when young with proper screens. The experiment, however, is not altogether new. We have long been familiar with the experiment, and believe it was tried by Mr Knight. But granting its novelty and the wisdom of the plan where practicable, we are by no means prepared to assent to his views that this is the only cause of canker. The origin of the disease is often difficult enough to trace, but on the other hand it is often quite clear to what it owes its rise. Sometimes it is cold and wet, as Mr Pearson tells us, acting on unripened wood; sometimes as certainly intense heat, or alternations of cold and heat; the soil

* Canker in fruit trees: its certain cause and certain prevention. By John Pearson, 8vo., pp. 12. Published by Mrs Pearson, Mass House, near Bewdley, 1857.

is ungenial, the roots run too deep into the ground, and either meet with stagnant water or too low a temperature; the weekly constitution again of some varieties is such that without any apparent cause, the tissues become diseased. When once these are impaired, from whatever cause, there is always danger of the incipient decomposition being communicated to neighbouring tissues, and in those trees more especially where gum oozes out under such circumstances, the wound is seldom permanently healed. That the injury often proceeds from a bud we have ourselves stated our conviction in this Journal. We have for instance, traced in the Bedfordshire Foundling, extensive canker to a particular bud, and that on a tree where no other cankered branch had ever appeared; but though this is sometimes the case, we have abundant evidence that the disease arises in spots where there is no bud either developed or latent, and where no internal injury has been received, whether accidental or from injudicious pruning.

It is well known how much more Peach trees suffer in the open quarter of a nursery, or where no care is taken to protect them, and this is one amongst other reasons why it is always the best economy to obtain such trees, though it be at double the expense, from respectable nurserymen who have a character to lose. But however good the early nursing may have been, it will avail little unless it is remembered that the trees are truly exotics, and require care and scientific treatment even where hot walls and other expensive appliances are out of the question. Mr Pearson deserves our thanks for calling attention to this point. The ill-ripened wood of succeeding years will canker just as badly as before when subject to strong atmospheric changes, and ungenial soil and subsoil will be sure to aggravate the evil. We do not, however, subscribe to his theory of the conversion of the sap into gum being due to a mere oxidation. It is the subtraction of one or more particles of the constituents of water which makes the great difference between many of the substances with which vegetable physiology is most conversant. Why the diseased tissues produce gum is a mystery not yet explained. If all the cells were simply filled with gum, and the effect of disease was simply to break down the walls, and liberate the contained gum, we should still have to account for its increased density. Nor indeed does gumming always arise from exposure to the atmosphere. In many cases where the tissues have not been at all exposed the gum collects, distending all around till it at length bursts through the cuticle, generally in an upward direction. Gumming sometimes arises from a deep seated stratum covered with one or more layers of wood through which it bursts, ultimately forcing its way through the healthy bark above, and inducing at the same time disease along its course. We have before us a branch of an Apricot in which this has been the case, the gum having formed a circular orifice through the superincumbent tissues till it burst through the cuticle. The tissues below the healthy wood were diseased for some distance, those parts above only being injured where the gum forced a passage. There could have been no immediate contact of the diseased parts with the external atmosphere. Mere conjectures about such matters are of little avail, except so far as they may lead a competent chemist to turn attention to some particular point, and the subject is one which richly deserves more accurate investigation than it has received at present. It is very possible that the decay of cell-walls may have some especial chemical effect upon the matter which they contain, though it must be remembered that canker does not always induce gumming, which is a mere symptom peculiar to Almond-worts (*Drupaceæ*) as far as regards the fruit trees which we cultivate.

In conclusion, we cannot help remarking that the matter contained in books upon the subject of canker is not so worthless as Mr Pearson seems to imagine. We may refer him amongst other sources of information to a paper of Mr Knight's published in 1817, to several communications in our volume for 1844, to the communications of Mr Lovell and Mr Whiting to the Horticultural Society of London, published in the volumes of its Transactions for 1851.

and 1858, and Mr Reid's papers quoted in the new edition of the *Theory and Practice of Horticulture*, in all of which there is much valuable information. We do not, however, by these observations at all wish to detract from the merit of Mr Pearson's experiment, but merely to give a caution that we are not to consider the question as by any means completely set at rest.

M. J. B.

WHAT IS IT THAT KILLS TULIPS?

Although I am not in the habit, nor, indeed, capable of writing for the public eye, I hope you will excuse me, as an old Tulip grower of from thirty to forty years standing, if I venture to make a few observations on the losses sustained by so many growers. I can well remember the destruction (for it was hardly less) of the bed (valued at one thousand guineas) of the late Mr Davey, of Chelsea. He thought some evil disposed person had thrown something over the bed which poisoned the bulbs. With the assistance of friends and considerable purchases, he contrived again to make up his large bed, taking every precaution of using fresh earth, &c.; but the result was almost the same. The following year found him with only the wreck of the preceding one; yet, with a few more additions he made up another very small bed, and this time removed it to another part of his garden, *lying considerably higher*. I saw this bed in bloom, and nothing could be healthier or more vigorous.

A few years afterwards Mr Alderman Masters, of the Exotic Nursery, Canterbury, one of the most scientific horticulturists in this county, began to grow Tulips, and imported a considerable number from Holland. I saw them blooming the first year, and did not remark any appearance of disease. Soon after, I think the very next year, he grew them at a different part of his garden, *lying much lower*. At blooming time there was scarcely one living. Mr Masters believed, and I dare say believes to this day, that they had been willfully destroyed. I must observe that his grounds are what is termed in these parts very *land springy*, and low-lying. There is a *mineral spring* on the premises, to which invalids occasionally resort, but I am unable to say what the nature of the water may be.

I have a near neighbour who has lost many bulbs annually for the last ten or twelve years, and whose stock is now reduced to about a dozen or fourteen rows. His garden is in a *very low situation, without any artificial drainage*, with a large slub-hole at or near the entrance which must drain into the garden. He has always been a great advocate for covering, commencing very soon after planting.

And now I must beg permission to say a few words about myself. For many years I continued to grow my Tulips in the same place, turning up the earth eighteen or twenty inches deep immediately after taking up, and repeating the operation several times before planting time arrived again, occasionally adding a little fresh garden mould quite free from manure. This mode I continued until one year, I lost upwards of thirty bulbs. Since that time I change the situation of my bed almost every year; now using my Pink, now my Aster, and now my Verbena bed, so that any manure used has had its strength exhausted by a previous crop. I never cover until I can see the bloom, let the weather be ever so severe. Since I have pursued this plan I have not lost one bulb, and my blooms are remarkably clean. From what I have stated I conclude that the mortality among Tulips, of which we hear so universally, may be attributed to growing them too long in one bed without considerable additions of fresh mould—to over-covering—and, above all, to the want of good and efficient drainage.—JOHN SMITH, Feversham, in *Gossip for the Garden*.

TEMPERATURE AT DIFFERENT HEIGHTS FROM THE GROUND.

All know that the temperature of the air diminishes as we rise into it. A mountain is clothed at its base with Palms and Plantains, Epiphytal Orchids, Bromelads, and other forms of tropical vegetation, while its summit is crested with eternal snow. The thermometer may fall upon the sides of the mountain from 100° to 0° , or in any such proportion.

This fact, which is familiar to schoolboys, is often applied horticulturally by placing a garden at the lowest level attainable. Nor has this been unnatural, for if the fall in temperature as we rise into the air is a general rule, some decrement ought to exist at slight as well as much decrement at great elevations.

Some excellent observations upon this subject were made by Dr Hooker in our last year's volume, p. 192. It was there shown, from Quetelet's observations as given by Alphonse de Candolle, that at Brussels a thermometer at 10.8 feet elevation stands in summer $5^{\circ}6'$ higher than one placed on the surface of the soil, quite contrary to the usual belief, but on the other hand that the lowest temperature on the surface at 9 A.M. during the spring being $35^{\circ}4'$ it was $2^{\circ}3'$ lower at the 10.8 feet elevation, which would be according to rule. Thus, according to Quetelet, the absolute surface is warmest in spring when small differences in temperature are of the most importance to gardeners; and, if this be really so, spring crops should always be at the lowest level attainable, as our forefathers thought. But when we see how constantly orchard fruit escapes spring frosts on the topmost boughs of a tree while it perishes on the lower, it is difficult not to suspect either some error in observation, or that 9 A.M., the time of Quetelet's observations, when the effects of nocturnal radiation are disappearing, is an unsuitable hour for the examination of thermometers provided for the purpose of determining such questions as that before us.

Further experiment upon this subject was therefore desirable, and accordingly, in the beginning of March of the present year, an apparatus was provided in the Garden of the Horticultural Society for the express purpose of determining the lowest temperature experienced during the night at various elevations between the surface and 36 feet above it. Upon a perpendicular pole five accurate self-registering thermometers were fixed at six feet distances, and a sixth was placed on the ground. Every morning the state of these thermometers was carefully noted, and we now produce the result for a few days in April and May when vegetation was becoming active, and when all tender crops were most sensible of low temperatures.

Thermometers at	Feet. 0	Feet. 12	Feet. 24	Feet. 30	Above the surface.
April 12	30°	$33\frac{1}{2}^{\circ}$	35°	35°	
" 15	24	27	28	28	
" 16	25	$27\frac{1}{2}$	29	30	
" 17	27	30	32	32	
" 21	31	35	38	37	
" 24	24	28	28	28	
" 29	23	26	27	27	
May 3	26	31	32	32	
" 4	31	33	34		
" 5	23	27	28		
" 6	27	32	33		
" 7	25	29	30	30	
" 8	28	$29\frac{1}{2}$	31	31	
" 18	37	40	$41\frac{1}{2}$	42	

This it will be observed is entirely opposed to M. Quetelet's observations; but at the same time is consistent with what occurs, as we have already said,

on the topmost and lowest boughs of a fruit tree. It shows conclusively that in the spring the night temperature near the ground is much lower than at small distances above it.

It proves that the air 12 feet above the ground is in April and May, the period of our fatal frosts, about 3° warmer than on the surface itself; that at 24 feet it is from 4° to 7° warmer; but that the difference between 24 feet and 30 feet is immaterial. Surely this is a fact not to be lightly regarded by the gardener, especially when it is found that the sharper the cold on the ground level the greater the gain in warmth on a higher level. The above table shows that although the thermometer may not fall below 32° at 24 feet above the ground, it may stand at 25° on the ground itself; an immense difference when we consider how sensitive plants are to even small variations of temperature, especially when they are growing fast, as in the spring. Whether this happens, as a friend suggests, in consequence of cold being radiated from the ground, or whether it arises from any other cause is practically unimportant. The fact remains. Only it must be remembered that if the lower temperature of the surface is really due to the radiation of cold from the earth, then similar differences would exist at all elevations above the sea.

That being so, it becomes a serious question whether in gardens where there is no natural fall of the ground, and where artificial rises cannot be provided, it is wise to rely for a crop of fruit upon dwarf trees to the exclusion of standards. For it is evident that in the first case all the blossoms may be frozen in a night, when those in the second would escape.

It is scarcely necessary to dwell further upon this point at present; the facts above cited speak for themselves. But we certainly should like to hear from intelligent observers whether any experience, having sufficient exactness for the purpose, can be produced either for or against the inference we seem justified in drawing. In the meanwhile we may point out one case which came last autumn under our own observation. In a county where there was a general failure of orchard crops, one orchard only bore as abundantly as usual, and that orchard enjoyed no advantage that we could discover, except that it stood near a river some 50 or 60 feet higher than the neighbouring country. In this case was the air really warmer in the orchard than at a lower level, or was the crop secured in consequence of the air of the orchard, after having been cooled down by radiation, rolling down to the river as its temperature decreased?—*Gardeners' Chronicle*.

VEGETATION OF BORNEO.—All over the padangs or great Grassy plains of this country the Oulin clumps stand up, white and ghastly mementos of the vast forests which once covered the whole district, and of which the oldest natives have no recollection; the stumps were there when they were young, and to all appearance will be there for a hundred years longer. In many cases they are hollow, and then a large tree has frequently grown in the centre, and by its gradual increase split the Oulin into three or four pieces. In some places the padangs are covered with trees, which thus look as if they grew in huge flower-pots, and whose roots squeeze themselves in strange shapes through the cracks of their ancient pedestals, which have preserved them when young from the fires which, in the dry season, sweep roaring and crackling across the padangs, destroying every living leaf. The trees chiefly seen in the padangs are *Vitex tomentosa*, *Embllica officinalis*, and some two or three others, whose bark, being very full of sap, resists the fire for a moment or two. That is enough, for the tempest of flame, fed only by Grass, is gone in an instant; and when a tree has, by one accident or another, survived three or four years, it is safe from such immediate destruction. These padang trees however, after all, are destined to perish by fire. A bit of bark is killed or knocked off: perhaps a dead stick has rested against it, and given the fire time to kill the bark; or a buffalo rubs his horn, or a pig whets his

tusk there. Then the verdict has gone forth; next year the bit of bare dead surface burns long enough to kill further the edges of the wound, which is next year, and every year, more and more extended, till the tree stands up, as upon a stick, which gives way to the first storm, generally however alive to the last moment. Wherever a group of trees, other than of these few species, is seen on the padangs, it is a pretty sure sign of nearly bare rock, or gravel, too barren to carry *Alalang* (*Imperata Koenigii*) sufficiently thick to conduct the fire. The changes in the appearance of these vast Grassy plains within a few days is indeed singular. After the long dry weather they are a light greenish yellow; the fire passes, and leaves them black; in three days more they are the lightest and freshest of green again; and in ten days after the fire they are white, as if a snowstorm had fallen upon them, with the waving plumes of flowers, which never appear except after fire, though it be delayed several years. Of course these fires destroy all that is above ground of thousands of sapling trees, but the roots remaining alive throw up fresh shoots; these in their turn are burnt off year after year, and again, year after year, fresh shoots are thrown out from the edge of the stool, which becomes at last a thin distorted disc of wood, fixed to the ground by innumerable perpendicular fibres, and burnt perfectly smooth on the upper surface. These bare stools, sometimes 18 inches in diameter, have a strange appearance immediately after the fire, but are soon again hidden by the Grass.—*Hooker's Journal of Botany.*

THE VINE IN CINCINNATI.—The few days that I remained in Cincinnati were spent among very agreeable company. I visited Mr Longworth's wine vaults, which have become one of the sights of the town. Great credit is due to this gentleman for his perseverance in introducing and promoting the cultivation of the native Grape for the making of wine, which is now beginning to compete with the wines of Europe. As I by no means pretend to be a connoisseur, I cannot say how far the sparkling Catawba falls short of good champagne. To my taste it seemed to retain a little of the peculiar flavour which predominates to a disagreeable extent in the wild Grape that is so abundant in the woods. The vineyards occupy the southern slopes of the rounded hills on the banks of the river. The soil is a tenacious loam, and is usually trenched two feet before the Vines are planted. It only contains a moderate quantity of vegetable mould, which is said to be more abundant on the northern exposures of the hills than on the southern, in consequence of the accumulation being greater where the soil is less directly exposed to the action of the sun's rays. It was reckoned that there were 1500 acres in Ohio exclusively devoted to Grape-growing in 1853, of which 800 to 400 acres are in the vicinity of Cincinnati. On the Kentucky side a considerable quantity of land is likewise devoted to the Grape, and its culture is also extending along the banks of the rivers in Illinois, Indiana, and Missouri. Some of the vineyards yield from 7000 to 8000 gallons. The culture of the Grape, however, rarely furnishes a profitable investment for capital, if hired labour is wholly employed. The German settlers realise a good income from this source, as their families all assist. A piece of land from fifteen to twenty acres, with a house on it, is given to a German family, on condition that they plant a certain quantity of Grapes every year, and pay the proprietor one half of the proceeds of the vineyard.—*Russell's America.*

REPULSION OF WATER FROM THE LEAVES OF THE NELUMBUM.—This phenomenon, with the *Lotus* more particularly, is one of common occurrence, though it has in general been very differently explained. It is beautifully manifested by the little *Pistia*, a water plant abounding in the shallower of our tanks, and resembling in appearance the common Endive. This plant, which either roots itself on the margin or floats about on the surface of the water, has both sides of its leaves covered with a fine fur of silvery hair-like papillæ, which when magnified show themselves in the form of a succession

of beads diminishing in size towards the apex;—they entangle and retain the air, and so obtain a high degree of buoyancy. When pressed under water they look like little flowrets of leaf or of frosted silver. It is the same organisation that enables Rose, Clover, and young Cabbage leaves, young shoots of grain and Grass, and the numberless other plants that exhibit dew in its beautiful pearly form, and not as a little unreflecting pool, to repel water from their surfaces, the same that produces like results usually ascribed to oil or grease on the feathers of birds, especially of water fowl, and most of all of divers—which when they plunge under the surface seem to carry with them a perfect flash of light. A piece of glass, a varnished or greased surface or polished stone, throws the water off as perfectly as the various matters enumerated; but in none of these latter cases is there any appearance of reflection. The water, for the time being, is in perfect contact with the surface which throws it off—without being wetted—where there is no intervening air plate, essential to secure reflection. I have not before observed any such explanation as has been here attempted, offered for this very beautiful class of phenomena;—it seems to me perfectly conclusive as well as new. — *Dr Buist's Notes on the Lotus.*

PROCESSES AND CONDITIONS OF PETRIFICATION.—The process of petrification, generally speaking, consists in the infiltration of stony matter into the pores of vegetable or animal substances. In some instances the organic body has almost entirely disappeared, and the stony matter has been so gradually substituted, particle for particle, that the petrification presents a perfect resemblance in its minutest parts to the original structure. Petrification has been artificially imitated by burying bones in mud, clay, and lime, and it has been found that after a time the bones become black, harder, and heavier; and had the process been continued, they would have eventually been undistinguishable from true fossils. Springs holding lime or flint in solution are familiar examples of petrifying agents when they convert pieces of moss, straw, twigs, and branches, into calcareous and siliceous matter. Lime and flint are perhaps the most abundant petrifying substances in nature; but many fossil bones and shells are converted into metallic crystals, vegetable remains into bituminous masses like coal, and not unfrequently trunks of trees have their forms perfectly preserved in a strata of fine-grained sandstone. Without entering upon the obscure and as yet little studied processes by which organic substances are preserved in the crust of the earth, we may notice a few of the more obvious, rather with a view to indicate the nature of the subject than attempt to teach its details. A shell, like the common cockle, may be buried in a mass of calcareous mud, and when so enclosed it is of itself composed of carbonate of lime and a little animal matter. As it remains imbedded chemical changes take place—the animal matter decomposes and passes off in a gaseous state, and its place is supplied by an additional infiltration of lime from the mass. If iron in solution be present in the mud, the sulphuretted hydrogen arising from the animal decomposition will unite with the iron, and the shell will become coated or incrustated with shining iron pyrites, or sulphuret of iron. As the calcareous mass becomes consolidated into limestone rock, the shell will also become hard and stony, but still preserving its form to the minutest ridge and corrugation of its exterior surface. By-and-bye, carbonated waters may filtrate through the pores of the limestone; the shell may be dissolved entirely, and leave only a hollow cast of its form. Another change may now take place: water holding silicious water may percolate through the rock, and the hollow shell-cast be filled entirely with flint. As with flint, so with crystallised carbonate of lime, with iron pyrites, or even with a soft clayey deposit that yields to the scratch of the nail. All these are possible changes, and changes which every day present themselves to the palaeontologist; and as, with such a shell, so with a tooth, a fragment of bone, a fish

scale, a mass of coral, the net-work of a leaf, or the woody fibre of a drifted pine-branch. The structure of the organism is always more or less preserved, and forms a basis for the petrifying solution, which thoroughly pervades it without disturbing the arrangement of those parts on which its characteristic form depends. It is this form or external character which enables the palaeontologist to compare and classify fossils with existing plants and animals; and it is this internal arrangement of cell and fibre, as revealed to the microscope, that enables him to detect bone from shell, and the bone of a bird from the bone of a mammal.—*Advanced Text Book of Geology, by David Page, F.G.S.*

FRUIT TREES.—LATERAL BRANCHES BY BUDDING.—Judicious cultivators of fruit trees well know the advantage of an abundant supply of lateral branches, and have too often occasion to regret the deficiency in that particular in trees purchased from the nurserymen. Trees so purchased are generally trimmed up for several feet from the ground, to give them an appearance similar to trees that grow upon the lawn, where "the browsing line" seems to indicate the popular idea of the line of beauty in arboriculture. This practice is particularly objectionable where it is desired to cultivate trees as pyramids or "*en quenouille*." To remedy the evil and to supply the defect, the following ingenious mode of budding was practiced by an old and esteemed friend of your correspondent, now deceased; it may be new to many of your readers, as it was to myself when first communicated by the venerable horticulturist I have referred to. His plan was this; when he found a tree—a Peach tree for instance—that had been deprived of its lateral branches too high from the ground, or which had an undue proportion of weight thrown upon one side, of branches otherwise very proper to leave undisturbed, he would proceed to cut out, (but without ragged edges,) quite large irregular shaped pieces of the outer bark, nearly down to the wood; and at such intervals a part on the side where it was desired to have the additional limbs, as seemed most judicious. This operation was followed, of course, by an effort on the part of the tree to protect the wounds thus inflicted by a renewal of the natural covering; and the result was the formation of a new, and for the time, of a young and tender bark. Into this young bark buds could be inserted with the same facility as into the bark when the tree stood in the nursery—and its denuded body be once more clothed with that protection from the sun and wind of which the knife of the nurseryman had stripped it.—E. L. R., Baltimore, Md., a *Correspondent of the "Country Gentleman," Albany, U. S.*

SCOTTISH PANSY SOCIETY.

The Thirteenth Annual Competition of this flourishing Society was held in the Zoological Gardens, Edinburgh, on the 10th of June. The competitors were more numerous on this than on any former occasion, the number of blooms entered being above 1400, exclusive of Pan-ies in pots, which were not very numerous. The flowers were in fine condition, a great improvement being observable in the tidy clean way in which the whole of the blooms were staged; and, considering the continued rain which prevailed for some days previous, this must have been no easy task for the exhibitors to accomplish; and we have no doubt, had the weather been fine, the show would have been much larger than it was. Another cheering feature is to see that the influence of the Society is extending; every year we have new competitors from some hitherto unrepresented districts; this season having had representatives from every town of note, from Ayr on the west, to Aberdeen on the east, and from the inquiries for schedules this year from Inverness, Orkney, and Oban in the north, the presumption is that these towns will be represented at our next show, which takes place in Glasgow in 1858.

The following is a list of the successful competitors, with the names of the first prize stands in each class, which will give a very correct idea of the best blooms shown on this occasion.

Nurerymen's Class, 24 blooms—The first prize was awarded to Messrs Downie & Laird, West Coates Nursery, Edinburgh, for Duchess of Wellington, Nonpareil, Flower of the Day, Royal Standard, Mr Masson, Miriam, Aradire, Lord Cardigan, Colonel Wyndham, Jeannie, Miss Talbot, William, Lord J. Russell, Sir Colin Campbell, Yellow Model, Countess of Rosslyn, St Andrew, Sir J. Cathcart, Beauty, Matchless, Una, Cyrus, Lady Mathieson, and Indian Chief; 2d, to Messrs James Dickson & Sons, Inverleith Nursery; 3d, to Mr T. H. Douglas, Rose Bank Nursery; 4th, to Messrs Robertson, Paul, & Co., Paisley; the leading blooms in the winning stand in this class were Duchess of Wellington, Countess of Rosslyn, Aradine, Lord Cardigan, Jeannie, Yellow Model, and Lady Mathieson.

Gardeners' Class, 18 blooms—1st, Mr Fraser, gardener, Belmont, with Sir C. Campbell, Flower of the Day, Satisfaction, Miss Talbot, Jeannie, Duchess of Wellington, Cyrus, Countess of Rosslyn, Duke of Sutherland, Nonpareil, Sir J. Cathcart, Miss Walker, Lord Palmerston, Miriam, Sir C. Napier, Sovereign, Monarch, and St Andrew; 2d, to Mr M'Farlane, gardener, Barnton; 3d, to Mr Reid, gardener, Broomfield; and 4th, to Mr Shearer, gardener, Yeater. In this class the competition was very strong; there was very little difference between the 1st and 2d; the winning stand, however, contained one or two blooms of rare excellence. Countess of Rosslyn was awarded the prize as the best light ground flower, and the finest Pansy of any class in the Hall. Jeannie, Cyrus, and Duchess of Wellington were also very fine.

Gardeners' Class, 12 blooms—1st, Mr M'Farlane, gardener, Barnton, with Jeannie, Cyrus, Climax, Sir C. Campbell, Emperor, Nonpareil, Lord Dunfermline, William, Indian Chief, Sir C. Napier, Miss Talbot, and Royal White; 2d, Geo. Hadfield, Esq., Haltwhistle, Cumberland; 3d, Mr Dunlop, gardener, Inglis Green; and a fourth to Mr Fraser. In this class the competitors were numerous, and the Judges had great difficulty in making the awards; the best blooms here being Sir C. Campbell, Jeannie, William, and Indian Chief.

Gardeners' class, 6 blooms—1st, Mr Young, South Bridge, with very fine blooms of Jeannie, Mrs Dodwell, Countess of Rosslyn, William, Cyrus, and Sir C. Campbell; 2d, Mr Beveridge, Inveresk; 3d, C. Stewart, Esq., Chirnside.

Amateurs' Class, 6 blooms—1st, Mr Hadfield, who produced very fine blooms of Jeannie, Royal Standard, Miss Talbot, Lord John Russell, and Mary Taylor; 2d, Mr Stewart; 3d, Mr Young.

Open Class, 12 blooms (4 light ground, 4 yellow do., and 4 self)—1st, Mr Thomas Reid, gardener, Broomfield, with very fine blooms of Mrs Dodwell, Alice, Royal Standard, William, J. B. Gough, Cyrus, Miss Bently (seedling), Indian Chief, Sir C. Campbell, St Andrew, Beauty, and Annie Caddell (seedling); 2d, Mr John Hampton, Newport, Dundee; 3d, Mr James Gibson, Brachead House, Cathcart, Glasgow. In Mr Reid's stand were very fine blooms of Miss Bently, Anne Caddell, and Indian Chief, which last was awarded the prize for the best dark self in the Hall.

Sweepstakes—1st, Messrs Dickson & Co., Leith Walk Nursery, with Sir C. Campbell, Cyrus, Jeannie, Sovereign, Lord Raglan, Sir J. Cathcart, Miss Talbot, Indian Chief, William, Miriam, Lord Palmerston, and Sir C. Napier. Cyrus, Jeannie, Indian Chief, and Lord Palmerston, were very fine in this stand.

Pansies in pots—1st, Messrs Dickson & Sons; 2d, Mr T. H. Douglas.

Amateurs' Pansies in pots—1st, Mr Young.

Single blooms, Gardeners' Class—best Self, Mr Reid, with Indian Chief; Yellow ground, Messrs White & Sinclair, Paisley, with a very fine bloom of Emperor Napoleon; Light ground, Mr Fraser, for an extra fine bloom of Countess of Rosslyn, which was also awarded the prize for the premier bloom in the Hall.

Single blooms, Amateurs' Class—Dark Self, Mr Hadfield, with a very neat Jeannie; Yellow Self, Mr Young, for Mrs Dodwell; Light ground, Mr Saunders, Juniper Green, with a very fine flower of Countess; Yellow ground, Mr Young, for an excellent bloom of Cyrus.

Seedlings were numerous, and many of them very promising. Mr Fraser was awarded a first-class certificate for a very fine Yellow ground flower named Mrs Hope. Certificates were also awarded to Mr M'Nab, Inglis Green, for a Light ground Pansy named Lizzy; to Mr Campbell, gardener, Pollock, Glasgow, for a Light ground flower named Maud; and to Messrs White & Sinclair, for a flower named Lady Napier—a light ground.

During the day the Annual General Meeting was held, and was numerously attended. It was resolved unanimously to hold the next show in Glasgow. The office-bearers were then elected; and the Treasurer having intimated that the funds

were in a healthy state, and that, notwithstanding the heavy pressure in the money market of late, the Society's stock was above par, he presented his Annual Subscription List, when all present contributed liberally, many of them doubling their subscription, and the handsome sum of £20 was subscribed in as many minutes. This shows the cordiality and good feeling in the Society, and the determination not to rest satisfied until something more is done for this noble flower.

EXHIBITION OF THE ROYAL BOTANIC SOCIETY, IN REGENT'S PARK, LONDON.—JUNE 18.

The second exhibition of the season held under the auspices of this Society, took place on Thursday the 18th inst. The day was all that could possibly have been desired, the show a good one, and the attendance large. Stove and Greenhouse plants were numerous, and in excellent condition. Of groups of 16 plants, the best came from Mr Whitbread, gr. to J. H. Colyer, of Dartford. It contained *Azalea Iveryana*, still in good condition; an immense bush of the Cavendish Heath, scarcely less sized *Epagris* and *Polygalas*, some magnificent *Everlastings* (*Aphelaxis*; one of the best specimens in the country of the Willow-leaved *Ixora*, covered with bloom; the white flowered *Ixora*, nearly equally fine, though scarcely so large a plant; the charming rosy pink blossomed *Dipladenia crassinoda*; a large red *Azalea*, and a huge *Pimelea decussata*. Mr Green, gr. to Sir E. Antrobus, Bart., showed 16 well cultivated and finely flowered plants. Among them were three splendid specimens of *Allamanda*, *Azalea variegata*, still full of flower; *Azalea Symmetry*, one mass of blossoms; a lovely *Stephanotis*, and a glorious example of *Erica depressa*. Mr Taylor, gr. to J. Coster, Esq., of Streatham, who was placed next in point of merit, sent some charming flowered *Aphelaxis*, *Dipladenia crassinoda*, *Rondeletia speciosa*, the white and red *Ixoras*, both beautifully in flower; *Azalea variegata*, a well-grown *Erica obbata*, and the pale yellow *Allamanda grandiflora*.

Groups of 12 Stove and Greenhouse plants were contributed by Messrs Cutbush Fraser, and Epps. The first sent the Cavendish Heath, a beautiful *Erica Bergiana* loaded with small round purple blossoms; *Rhynchospermum jasminoides*, and the very fine *Statice Holfordi*, alluded to in our report of the Chiswick Exhibition on the 3d inst., still in admirable condition. Messrs Fraser had two finely flowered *Allamandas*, various Cape Heaths, *Vincas*, *Azaleas*, the sweet-smelling *Rhynchospermum jasminoides*, and a handsome *Kalosanthes*. Mr Epps showed, among other things, good plants of *Stephanotis floribunda*, *Aphelaxis rupestris*, small, but beautifully flowered, an *Allamanda*, and *Rhynchospermum jasminoides*.

Among collections of 10 Stove and Greenhouse plants the best came from Mr Dods, gr. to Sir J. Cathcart, Bart. It consisted of a charming blue *Leschenaultia*, some admirably managed *Everlastings*, a yellow Heath, *Allamandas*, well flowered, *Vincas*, and *Leschenaultia formosa*. Mr Barter, who was placed second in this class, sent a large and fine *Ixora javanica*, scarcely however sufficiently in flower, a red *Azalea* equally large, a vigorous *Erica Cavendishi*, one of the varieties of *E. tricolor*, *Allamanda grandiflora*, and *Azalea Gledstanesi*. Mr Peed of Norwood contributed among other things a handsome *Dipladenia crassinoda*, the Hoya-like *Cyrtoceras reflexum*, two large Cape Heaths, especially one of *E. tricolor*, which was excellent, and an *Everlasting* (*Aphelaxis*). Mr Morris, gr. to Coles Child, Esq., contributed some *Everlastings*, the White *Vinca*, *Azaleas*, and Cape Heaths. Among Mr Hamp's plants was the yellow *Relbania squarrosa*, a plant seldom seen, but which when well grown and flowered as this was has a really good appearance.

In collections of 6 Stove and Greenhouse plants Mr Carson, gr. to W. F. G. Farmer, Esq., furnished *Rhynchospermum jasminoides*, *Ixora javanica*, not quite fully in flower, various *Aphelaxis* and *Polygalas*. In this group the most remarkable plant however was *Mussaenda frondosa*, which measured more than 2 feet in diameter, and being covered with large white bracts or floral leaves, it had a most conspicuous appearance. Mr Rhodes sent a large *Erica tricolor* Wilsoni, one of the very best Heaths of the class to which it belongs; the Box-leaved *Eriostemon*, *Ixora coccinea*, and the useful white-flowered *Dracophyllum gracile*. Mr Williams, gr. to Miss Traill, sent the well-known *Pimelea decussata*, magnificently grown and bloomed; its head was a regular half ball, quite 6 feet in diameter, forming one of the finest specimens of the kind perhaps ever exhibited.

Orchids were produced in about their usual quantities and condition. Collections of 20 came from Mr Gedney, gr. to Mrs Ellis; Mr Keele, gr. to J. Butler, Esq.;

and Mr Woolley, gr. to H. B. Ker, Esq. Mr Gedney furnished *Aerides odoratum*, affine, and Feildingi, *Odontoglossum citrosum*, *Phalaenopsis grandiflora*, beautifully flowered; the white *Calanthe veratrifolia*, very fine examples of *Cattleya Mossiae* and *C. superba*, the last with handsome purple flowers with deep crimson tipped lips. In Mr Keele's group were *Anguloa Clowesi*, with four large yellow blossoms; *Dendrobium tortile*, with sulphur coloured trumpet-shaped lip and pink sepals and petals; *Cattleya Mossiae* with 10 flowers each measuring half a foot across; a small plant of the orange *Epidendrum vitellinum*, *E. verrucosum*, and the red *Trichopil (T. coccinea)*. From Mr Woolley came, among others, examples of the sweet *Vanda (V. suavis)*, *Sobralia macrantha*; *Saccolabium praeorsum* and *guttatum*, each with flower spikes large enough to form wreaths for the head; *Barkeria spectabilis*, well bloomed; *Cattleya intermedia*, and *Lycaste Deppel*.

Collections of 16 Orchids came from Messrs Veitch, Jackson, and Parker. From the first came the rare *Cattleya Aclandiae*, the White Butterfly plant (*Phalaenopsis amabilis*), two of the best varieties of *Cypripedium barbatum*, or Bearded Lady's Slipper; *Aerides Feildingi*, and other species; *Vanda tricolor* and *suavis*, the Yellow *Cattleya citrinia*, and *Brassia caudata*. Messrs Jackson furnished the Bearded Lady's Slipper, a handsome *Phaius Walliichi*, *Calanthe Masuca*, and some well flowered *Cattleyas*, among which was *C. Wageneri*, a species with pure white blossoms stained in the throat with yellow, and certainly a real acquisition to this class of plants. Mr Parker sent, among others, showy examples of *Cattleya Mossiae*, the yellow *Dendrobium densiflorum*, and *Aerides viridis*, and *odoratum*.

Groups of 12 Orchids came from Messrs Clarke, Carson, and Morris. The first had *Phalaenopsis* in fine condition, *Dendrobium tortile*, the Moss *Cattleya*, and various *Aerides*. Mr Carson sent *Dendrobium Farmeri* and *moschatum*, *Saccolabium Blumei*, the pale straw-coloured *Miltonia stellata*, Lady's Slippers, and *Odontoglossum hastilabium*. From Mr Morris came *Acineta Humboldtii* with three spikes covered with brown spotted flowers, and finely bloomed specimens of *Stanhopea tigrina*.

Collections of 6 Orchids were contributed by Messrs Bunney, Ivison, Green, Barter, and Dedman. In these groups we noticed good plants of *Saccolabium guttatum*, *Cattleya Mossiae*, *Stanhopea tigrina*, *Dendrobium chrysanthum*, *Aerides odoratum*, and *Acineta Humboldtii*.

Roses in pots were good for June. They were contributed by Messrs Lane, Paul, and Francis; Mr Terry, gr. to Lady Puller; Mr Mortimer, gr. to J. R. Scott, Esq., and A. Rowland, Esq., of Lewisham. Among Mr Lane's plants were Miss Glegg, Baronne Prevost, Chenedole, Paul Ricaut, Madame Plantier, Queen, and Coupe de Hebe. Messrs Paul also had Coupe de Hebe, Velours Episcopal, a handsome Rose; Madame Masson, Blairi No. 2, Duke of Cambridge, and Jules Margottin. Among Mr Francis's plants were Paul Perras, Charles Duval, Auguste Mie, Amandine, and Devoniensis. In other groups we noticed Paul Ricaut, and Paul's *Victoria* finely flowered. Mr Francis showed a collection of small Roses on Manetti stocks. Among them were Jules Margottin and General Jacqueminot, the latter more double than ever we remember it.

Of cut Roses fine boxes came from Messrs Paul, Mitchell of Pitdown, Francis, Epps, Wilkinson, Palmer, Terry, Frost, Rowland, and others. Among these were charming blooms of Gloire de Dijon, Paul Ricaut, Chas. Lawson, a large bold Rose, Caroline de Sansalles, Duchess of Norfolk, the new scarlet Rose Lord Raglan, a large, full, fine flower, which attracted, and deservedly, much attention; Gen. Castellane, Prince Leon, Madame Vidot, William Griffiths, Pauline Lansezeur, Emperor Napoleon, a very dark velvety flower; Souvenir de Malmaison, Madame Place, Souvenir d'un Ami, and Narcisse de Salvandy, a small crimson mottled with white. These, it may be added, are all first-class flowers.

Cape Heaths were contributed in good condition by Messrs Epps, Glendinning, Cuthrush, Whitbread, Williams, Peed, Taylor, Harlock, and Rhodes. Among the different varieties were tricolor Wilsoni, and other sorts belonging to that class; *metuliflora*, *denticulata moschata*, *depressa*, *ventricosa grandiflora*, *Cavendishi*, *Bergiana*, *ampullacea*, *mutabilis*, *Massoni*, *perspicua nana*, *gemmifera*, and *tortiflora*.

Azaleas and Tall Cacti were shown by Messrs Green, Peed, and others; the varieties, however, which were considerably past their best, differed but little from those produced by the same growers at Chiswick on the 3d and 4th inst.

Of novelty there was little. Mr Linden had some remarkably fine foliaged plants—among them *Cyanophyllum magnificum*, with leaves more than one foot long and nearly half as much wide; and *Bahmeria argentea* attracted considerable attention, more especially the first, which was truly beautiful. Some *Marantas* and

variegated plants also came from Mr Parker. Mr Glendinning again sent *Farfugium grande*, and the new Chinese Larch (*Abies Kæmpferi*). Messrs Veitch had *Grevillea Drummondii* in flower, and *Theophrasta latifolia*, the latter with a compact head of greenish yellow blossoms as large as that of a Cauliflower. Mr Cutbush had *Rhododendron Jenkinsi*, a Bhotan kind, with white flowers tinged with pink, measuring some 2 inches across the mouth. The same nurseryman also showed the Daisy-leaved *Stylidium*, a pretty pink-flowered kind. Mr Harlock had a scarlet Heath called *grandis*, which promises to be a good addition to that tribe of plants; there were likewise a *Dendrobium* in the way of tortile, a *Cattleya* belonging to the *Mossia* class, and an *Aerides*.

Ferns were produced in excellent condition and in great variety, nine collections of Exotics being staged. The first prize was won by Mr Parker, nurseryman, Holloway, whose fine mass of *Gleichenia* *alias* *Mertensia fibellata* was unsurpassed. In the same collection was a remarkably fine plant of *Hymenodium* *alias* *Acrostichum crinitum*; also *Cheilanthes elegans*, *C. hirta* var. *Ellisiana*, *Davallia tenuifolia*, *Pteris scaberula*, all finely grown and extremely elegant species, backed up by some large *Cyathea*, *Dicksonia*, *Cibotium Schiedei*, &c. The second prize was awarded to M. Baillie, gr. to W. C. Carbonell, Esq., who showed a fine plant of the rare *Microlepia platyphylla* *alias* *Davallia lonchitidea*; other fine specimens in this collection were *Cheilanthes frigida*, *Pteris scaberula*, *Lomaria nuda*, together with larger plants of *Lastrea invisa*, *Cibotium Schiedei* &c. The third collection was that shown by Mr Fletcher, gr. to Dr Young, the best of whose plants were two handsomely grown *Gleichenias*, *dicarpa* and *Speluncæ*; and a very handsome *Todes pellucida*. Among the other collections Mr Gedney had a fine specimen of the true *Gymnogramma chrysophylla*; Messrs Jackson & Son had *Adiantum caudatum*, *Platynerium stemmaria*, and *Gymnogramma pulchella*, var. *sulphurea*; in a collection of some small but very nicely grown plants, Mr Hally had the two species of *Hemionitis*, *cordata* and *palmata*, remarkable for their dissimilarity to Ferns in general. Several plants of the Silver-frosted *Gymnogramma*, called *peruviana* var. *argyrophylla*, were exhibited in the different groups. The first prize, the only one awarded for British Ferns, was given to Mr Baillie, gr. to W. C. Carbonell, Esq., whose collection, consisting of twelve interesting species and varieties, contained *Polypodium alpestre* and its var. *flexile*, a very nicely managed *Asplenium Trichomanes incisum*, and the rare *Polystichum angulare* var. *imbricatum*. The other collections exhibited were disqualified from their containing an exotic species, not British.

Of *Gloxinias*, upright kinds, some handsome varieties were shown by Messrs E. G. Henderson and Lane; among them the most striking were *Boothiana*, *M. Picouline*, *Princess of Prussia*, *Carthusiana*, *alba auriculata*, and *rosa ignea*.

Miscellaneous subjects consisted of a collection of variegated plants from Messrs Henderson, Pine Apple Place, two dozen very pretty *Amaryllids* from Mr Hamp, blooms of *Pæonies* from Mr Salter, and *Pinks* and *Pansies* from Mr Turner. Messrs Downie & Laird, Edinburgh (to the latter firm the Society's Silver Medal being awarded), and others. We also remarked some *Cockscombs* and *Balsams*.

Pelargoniums were shown in excellent condition by the usual exhibitors of them.

There was a large bank of Seedling *Pelargoniums*, several of which possessed considerable merit; nearly all of them were sent by Mr Turner. *Etna* (Turner) is a rich crimson scarlet, with dark top petals, very free and fine; several plants were exhibited: *Mazeppa* (Turner) appeared to be by far the best of the dark spotted varieties; *Richard Benyon*, rich crimson; and *Empress Eugénie* (Story), a pure white, of fine form and substance; *Rose Celestial* and *Rosy Gem* were good, and new in character; also a pretty new spotted variety, named *Queen of Beauties*. Seedling Fancies were numerous, *Mrs Turner*, *Acme*, *Queen of Lilacs*, *Alice*, *Clara Novello*, *Princess Royal*, *Indispensable*, and *Rosabella* are all new and fine. These were raised and exhibited by Mr Turner, of Slough.

New Bedding *Geraniums*, with variegated foliage, were shown in considerable numbers. Perfection is, however, by far the best, having pure white variegation with rich scarlet flowers.

In named *Pelargoniums* the most interesting were the new class varieties sent out in 1855-6. The first prize was awarded to Mr C. Turner for *Spotted Gem*, *King of Scarlets*, *Agnes*, *Pallas*, *Matilda*, and *Hermione*, all well contrasted flowers, the plants being clothed with fine large blooms. Mr Nye, gr. to E. Foster, Esq., *Clewer Manor*, had the next best collection.

Calceolarias were contributed both in the shape of herbaceous and shrubby kinds. The last however seemed to excite most attention. Mr Turner's group consisted

of beautiful sorts extremely well flowered. Their names were Orange Perfection, Clown, King of Sardinia, Yellow Dwarf, Golden Nugget, and Lady Middleton.

Pine Apples, of which there were in all about 47, were large and well ripened. A Providence weighing 12 lbs., girthing round the middle $23\frac{1}{2}$ inches, and measuring 13 inches in length, was shown by Mr Barnes of Bicton.

Of Grapes there were some 38 dishes of black, and 26 dishes of white sorts. Black Hamburgs were shown in capital condition. Muscats, though better than at the Crystal Palace or Chiswick, were not by any means all quite ripe. Very good Grizzly Frontignans, and good West's St Peters were also shown.—*Gardeners' Chronicle*.

CALENDAR OF OPERATIONS FOR JULY.

VEGETABLES.

The end of June and beginning of July is a very important period, as, if a full supply of kitchen material is not sown and planted for winter and spring use, there will, without doubt, be serious complaints from the cook, which may reach head quarters. To avoid this, if a full supply of Broccoli, Brussels Sprouts, and Cauliflower is not already planted, the sooner it is done the better. A full supply of M'Ewen's Cabbage may still be sown; it is safe to have a good supply of that variety, which is very useful in spring. The principal crop of Celery should be planted about the middle of the month as the early crop does not stand the winter, a few should also be planted about the end of the month; it is useful in spring. Sow Turnips, Lettuces, and, for a succession about the end of the month, a good sowing of Spinach and Onions; the former will keep up a supply to the end of the year, and the latter come early in spring, when old Onions may be done. Keep down weeds, and on no account allow them to seed. The season, as yet, has been very favourable, and garden productions are looking very well. Gooseberries are rather scarce; Strawberries are very promising; Apples a fair crop, but not so abundant as was expected; stone fruit is scarce.

FORCING DEPARTMENT.

PINES.—Succession stock growing in pits must be well supplied with air, in order to prevent their making a weak and sappy growth; and, rather than allow them to get severely browned with intense sunshine, they should be slightly shaded during the hottest part of the day. Shaw's Tiffany is a most excellent material for this purpose, and especially for Pines where it is desirable only to shield from the intense rays. See that no check is allowed for lack of water at the root, and maintain a thoroughly moist atmosphere with regular syringings overhead on the afternoon of fine days at shutting-up time. In houses or pits where the crop of fruit is mostly cut by the end of this month, a re-arrangement of the fruiting stock should be made, and everything appertaining to the fruiting house thoroughly cleansed, and the command of a gentle bottom heat secured previous to being re-filled with another set of fruiting plants; and when re-filled, keep the forwardest of the fruit by themselves at one end of the pit, so that they can be kept more close and have more moisture than others that are in bloom or in earlier stages. Fruit that are done flowering should be watered every second time with liquid manure; and every extreme which is likely to check the healthy development should be carefully guarded against.

GRAPES.—In the case of houses where the fruit is all cut, we would reiterate former directions, and urge the necessity of keeping the foliage healthy and active, as long as possible, by keeping the house cool, admitting all the air possible, and by frequent syringings. See that Grapes intended to hang late, have their berries well thinned out; when left thick, it is much more difficult to save them from damping off, when the trying season arrives. Muscat houses should still be fired at night, and during dull weather be

careful not to be over liberal with moisture, otherwise the leaves will soon assume a sickly hue, and shanking be much more likely. It is safest never to allow the temperature to sink under 75° . If pot Vines have been forwarded as directed in former Calendars, they will now be strong canes, with full buds, and their wood changing to a brownish hue. Give an increased admission of air, remove all fresh laterals, or rather do not allow them to make any such growths. See that they are fully exposed to the sun, and bear in mind that unless the growth is thoroughly hard and ripened, no success can be counted on, in the way of fruit, from these next season.

PEACHES.—Give fruit that are colouring, abundance of air day and night, and encourage those swelling off with copious waterings of liquid manure, and mulchings of well rotted hot bed dung. Spare no amount of care and trouble to keep trees, from which the fruit is all picked, free from red spider. Put a handful of flowers of sulphur in a pot full of water, and well syringe trees where the pest may have appeared, and keep the houses cool, so that the foliage may be preserved in health till they have performed their functions.

STRAWBERRIES IN POTS.—Lose no time in getting the required number of these laid, and those that were laid in June should be shifted into their fruiting pots, and potted directly after they have rooted through the pots in which they have been laid. Where Strawberries are required very early, it is best not to shift them into pots larger than 48's so that they may well fill the pots with roots, and be matured, and got to rest early in the season. For general stock, use a soil composed of one-half mellow loam, and one-half well-rotted leaf-mould; and in the case of those which are intended to be forced early, add to this mixture a dash of road drift or coarse pit sand. When potted, stand them on some material, such as coal-ashes, to prevent the ingress of worms.

MELONS AND CUCUMBERS.—Remove by degrees the old vines from Cucumbers that have been bearing since early spring, and get young wood to take its place. Should the foliage suffer from intense sunshine, let them be slightly shaded in the middle of the day for an hour or two, but avoid shading if they will stand it with impunity. See former directions with regard to Melons in various stages. Get those intended for late crops planted out by the middle of the month.

FLORISTS' FLOWERS.*

DAHLIAS will now be growing fast; tie out the side branches to the stakes so that light and air may be admitted to all parts of the plant; pinch off shoots that are not wanted, to prevent over-crowding of the branches. Mulching the plants with short manure is very beneficial, more especially on light sandy soil. In dry weather water over the foliage in the evening with soft water; at this season earwigs and slugs must perseveringly be looked after.

HOLLYHOCKS.—Syringe the plants occasionally in the evening, and as much as possible on the under side of the leaves, which will be found a good preventative for red spider. See that these are securely tied to their stakes as they advance in growth. Should dry weather set in let the plants have a liberal supply of water at the roots. Continue to take off cuttings as often as they can be got from the bottom or side shoots.

PANSIES in pots, if not previously done, should be turned out into the open borders at once, more especially those sorts from which large increase may be wanted. Continue to take off cuttings as occasion offers, and plant out those struck on a cool border. Sow seed about the end of the month, and be careful to save only from the finest sorts.

CINERARIAS.—Pot off early raised seedlings. Sow again for a succession; take off cuttings from the named varieties; they will strike readily if placed in a cold frame and shaded from the mid day sun.

FUCHSIAS.—Shift on those intended for late bloom. Pinch and regulate

* By Mr J. Downie, of Downie & Laird.

the shoots so as to keep the plants uniform. Those in flower must be carefully and regularly watered; an occasional supply of liquid manure to the weaker growing sorts will be found beneficial.

CALCEOLARIAS, when done flowering, should have the flower stems cut off and placed in a cool shaded situation out of doors. Sow seed only from the best varieties, which should be sown in fine light soil.

PELARGONIUMS.—Cut down those getting out of bloom, or what may be wanted for early bloom next season, or stock; keep the plants rather dry for a short time before, as well as after cutting down. Fancies require similar treatment to the above, only they must not be so closely cut back or placed out of doors to break, as drenching rains may be fatal to many of them.

AURICULAS. *—Continue to keep the plants free from decaying leaves, stems and insects, and supply them regularly with water as they require it. By the end of the month the work of repotting must be commenced. Have a quantity of clean pots in readiness. Let the diameter range from 4½ to 6 inches, and, if possible, have the depth fully more. I use a layer of broken crocks, and over it another of oyster-shells, convex side up, over all. I place enough of vegetable fibre to prevent the compost choking the drainage. Study the habits of the plants, and pot accordingly; the strongest growers ought not to be in more than a 6 inch pot. In Auricula culture it is a serious mistake over-potting; better to have a plant working above than below the surface. When the plants are turned out of their pots reduce the ball with a sharp knife, and examine the end of the stem or tap root, cut back a little even when sound, but if decayed, then cut back to the sound portion. When offsets are on the plant slip them, and dress all the wounds with the powder of wood charcoal. Rub off the eyes around the neck to keep the plants up to blooming size. Should increase be wanted, then one or two, at most, may be left on. The plant will now be ready for repotting:—fill in some of the compost, place the plant exactly in the centre of the pot, spread out some of the fibres, so as to be in immediate contact with the side, fill up to near the top of the pot with the compost, keep the lower leaves clear above it, press it moderately tight, and a single stroke on the potting bench will level it. The offsets may be either potted singly, in small pots, or three may be potted round the edge of a 6 inch pot. At the end of each day give the shifted plants a moderate supply of water, and keep them from heavy rains.

POLYANTHUS.—Keep them free from decaying leaves, stir the surface soil occasionally. Supply them with water as needed, and do not allow vermin to injure them. Syringe under the leaves whenever they become spotted, to keep the red spider in check.

TULIPS.—Take up any of the bulbs that may be in the ground, and place them in a cool airy situation to dry gradually.

RANUNCULUS.—Soon after the bloom is past, the foliage of the plants will begin to decay. So soon as the leaves of any plant are yellow, it is ready for taking up. Let it be kept in remembrance, that if the roots are not taken up when ready, they will begin to grow again, to their very great injury, if not their total loss. My own practice is, to go over the beds every morning, and take up all that are ready, and so soon as the soil that adheres to the tubers is sufficiently dry, cut the flower stem away close to the crown with sharp scissors, pinch off the fibres, and clean the tubers from soil with a brush, and place the roots in a dry airy place to dry gradually; look over them occasionally to see if they are free from mould. Some sorts are late in ripening. Should there be danger from wet weather, cut the fibres well under the root with a garden trowel, and raise the ball a little way above the level of the bed; this will accelerate the ripening.

PINKS.—Commence the propagation of these plants, which can be done either by layering or piping, but the hardiest plants are those raised from pipings. Prepare the soil where they are to be struck in a shady situation,

* By Mr G. Lightbody, Falkirk.

turn it several times, and mix some quick-lime among it to kill and keep away worms; level it, and spread over it about an inch in depth, of the compost mentioned last month, to strike the pipings in. Whenever a sufficient quantity of pipings are ready, which is done by cutting below the second joint, take away the sheath. Shorten the points of the leaves, and the piping is prepared, place them in water for a little to plump them. Insert them about half an inch into the compost, and when the allotted space is filled, give them a good watering through a fine rose, and when the pipings are dry, cover them with the glasses, and at the end of about three weeks they will be rooted. During the rooting process, should they be exposed to a fierce sun, they will require to be shaded during its intensity. Water over the glasses occasionally with a fine rose—doing so refreshes the young plants. Prepare a nurserybed for the pipings, when struck; the soil cannot be turned too often. Search well for wireworm and that deadly enemy to the Pink, the common grub. The bed will require no dung. Should the pipings be overstimulated, they will not stand a rigorous winter. When the flowers are in bloom, cross a few of the finest with pollen from some sort of extra properties. Keep the pods under glass till the seed is ripe.

CARNATIONS AND PICOTEES.—Keep the soil in the pots free from weeds, and stir the surface whenever it becomes hard. Water liberally in dry weather, and continue to tie the stems to the sticks. Attend to the slipping of the small lateral buds, so soon as they can be got hold of. Keep the plants free from greenfly; should they be troublesome, water over all with a weak solution of tobacco water, and occasionally syringe them well. Many of the fine sorts now in cultivation produce their increase too high on the plant for layering conveniently. These may be piped as soon as convenient; they strike best under a small bell-glass in any light soil in which there is plenty of sand—these will make hardy plants to stand the winter. Toward the end of the month the flowers will begin to show colour; they must then be shaded and protected from rain; the pods will require to be tied with a soft piece of Cuba bast; and the same process gone through with respect to carding, wiring, &c., as recommended last month for the Pink. So soon as the flowers are seen to be in colour, the work of layering should be commenced. The easiest way of doing this is to mount the pot on a large stool or form—sit astride it—stir the surface soil, and break it fine. Cut away all the leaves from the joint where the cut is to be made to the stem of the old plant—the cut may be made either at the second or third joint. Use a thin sharp knife; begin the cut a quarter of an inch below the joint; cut quite through the same; then cut away the nib below the joint; place some sharp sand on the surface where the layer is to be placed; gently place the cut part into the soil, and peg it firmly down. So soon as a pot is finished, give it a good supply of water, through a fine rose, to fix the layers. After the layers are down, all waterings will require to be given through a rose. All run flowers, or those that sport to a self, will do for the border; it is of no use propagating them. Every means must now be resorted to to entrap and destroy earwigs, otherwise they will not leave a perfect bloom; spare no labour for their destruction. Should the weather prove favourable, and some of the flowers produce pollen, use every effort to cross others.

CHRYSANTHEMUMS.*—Disbud all lateral eyes, and tie the main stem carefully to the stakes. Water regularly and give weak liquid manure once or twice a-week, increasing its strength as the pots get filled with roots. Tie specimens regularly and carefully, turning the plants round twice a-week, to keep them evenly balanced. The Chrysanthemum will feel most grateful for a good syringing after a hot day, and will amply repay the trouble.

POMPOXES.—Tie the shoots regularly, lest the wind snap out the centre of the plant. Give liquid manure. Should mildew make its appearance, dust with flour of sulphur, and give greenfly a little Scotch snuff.

* By Mr Laing, Dysart Gardens.

THE SCOTTISH GARDENER.

GEOGRAPHICAL DISTRIBUTION OF PLANTS.—No. 1.

THE interesting branch of science commonly called botanical geography is mostly treated of in works of considerable expense or of rare occurrence, and therefore has met with less attention from general readers than it deserves. Perhaps the best exposition of it in English is that contained in Dr Balfour's valuable Class-Book of Botany. One brilliant lecture is devoted to this subject in Schleiden's *Plant, a Biography*—a book which we recommend to the perusal of all who meet with it. Interesting sketches are also given in the *Cosmos*, and other works of the illustrious Humboldt, the originator of this department of botany. Valuable matter is to be found in several of the volumes issued by the Ray Society, particularly in the translation of *Meyen's Outlines of the Geography of Plants*. Unquestionably the greatest work on the subject, at present extant, is the *Geographie Botanique* of the younger De Candolle—a work of vast labour, and great scientific precision—but which, owing to that precision, and the avoidance of everything picturesque in description, is better adapted for those who have made considerable progress, than for those who are only commencing the study. We mention these works as the original sources from which we would recommend all with leisure and opportunity to draw; but as some of our readers may not possess these advantages, we propose to offer them a few papers, which may, at least, have the effect of directing their attention to the subject.

The geographical distribution of plants presents itself in two points of view, according as we consider the aggregation of the masses, or the dispersion of the species which people the vegetable kingdom. We may investigate the manner in which plants and trees are bulked and grouped on extensive surfaces; or we may trace the different sorts, such as the Pine, the Oak, or the Palm, as they are scattered over distant regions and varying climes. It is the latter aspect—the distribution of the species—which is our proper

subject at present ; but before addressing ourselves to it, we may, for the sake of distinctness, throw a rapid glance at the other.

Let us imagine ourselves then in some desert place—for example, on the shores of Loch Coriskin, in the Isle of Skye. We turn our eyes landward, and scarcely a semblance of vegetation can we discover, from the rugged sea-beach up to the dark summits of the Coolin Hills. In the words of Scott—

Nor tree, nor shrub, nor plant, nor flower,
Nor aught of vegetative power,
The weary eye may ken ;
For all is rocks at random thrown ;
Black waves, bare crags, and banks of stone.

Lord of the Isles.

How different such a desert from the scenes exhibited by the deer-forests of Braemar, with their glades of bush and bracken, their tangled thickets of Birch and Oak, and swelling knolls crested by natural groups of aged and hoary Scotch Firs. Or, passing in fancy to the eastern coast, where the Lammermuir range dips into the sea—on the moderately elevated muirs we see square miles of heather growing on the bare backs of the strata, shaven at the height of three or four inches by the hissing east wind from the German Ocean, and presenting a surface as uniform almost as the pile of a carpet. How different, again, is this scene from the exuberant wheat and turnip fields of East-Lothian ; and how different, too, from the interior of the Lowlands, where the verdant woods and hedge-rows, and broad acres of waving grain, and broomy knowes, and green pastures, all mingle together in diversified and beautiful succession. Similar contrasts in the larger aspects of nature are to be found in every country in Europe ; but perhaps in America they are even more striking and surprising. In the north of New Mexico, right in the way of the retiring Mormon, and of the bold adventurer travelling overland to California, occur those frightful deserts called by the natives "*Jornada del Muerte*"—that is, Journeys of death. Composed of bare rock and arid sand, without a solitary spring of water, and with a sky of copper overhead, radiating heat like the roof of an oven, it takes a man on horseback two days to cross them, and not unfrequently they prove literally to the hapless traveller what their name imports. These terrible regions are often beautifully bordered by the flower prairie, and the grass prairie, and the bush and rolling prairies,* and the dense forests of that semi-tropical wilderness. It is still farther north, however, in the United States, or their adjacent territories, that the traveller meets with what may be called the real Prairies, the haunts of the red man and the buffalo. These are natural meadows, void of trees, and covered with grass 4, 5, or even 8 feet high. One of them, the Grand Prairie, is about 300

* We beg the reader's attention to an account of the Prairies of New Mexico given at a subsequent page, and a little abridged from one of Captain Mayne Reid's interesting volumes.

miles long, and 25 or 30 miles broad. What a world of grass is there! How different from the uncleared American forests or backwoods! In these the traveller must shape his course by the compass, or by the place of the sun. If he wants to look about him he must climb a tall tree, and then he sees only the tops of other trees everywhere around. Sometimes he can go ahead only by clearing a passage, with his axe, the breadth of his waggon; and the principal vicissitudes he meets with are the cane brake, and the pine barren, and, what is even worse, the occasional open space where the trees have been prostrated by the hurricane, and are lying rotting in inextricable confusion. The equatorial forests are denser and more tangled still. Through these, on account of their more luxuriant vegetation, and the interlacing of the creeping plants, the wild beasts themselves can scarcely make way. We find, then, regions of the earth nearly or wholly destitute of vegetation. There are others covered with a carpet of verdure, such as our low hills and chalky downs; or with a thick and tall matting of grass, as the *prairies*, and *llanos*, and *pampas* of America. And there are immense forests partially cleared away by the advance of civilisation in the Old World, but still existing in unimpaired extent in the New. This, as we have said, is one of the aspects in which the distribution of plants may be considered; and it is a very interesting one to the poet, and the painter, and the student of national resources; but it is *not* that which is usually distinguished by the name of the geography of plants.

Our theme, then, is the distribution not of the *masses*, but of the *kinds* of plants. It is calculated that the species of plants, described and undescribed, and at present known, amounts to about 100,000—some have thought that science may yet raise the number to 150,000, or even 200,000—and these are very variously and unequally distributed over the surface of the globe. The classified facts in regard to this distribution have been called the Geography of Plants, by the celebrated Humboldt, who was the first to introduce the subject, and who has done much to illustrate it. Had we only sufficient skill in unfolding this attractive theme, we should not fail to awaken the reader's intelligent interest and curiosity.

Suppose us, then, in a flower garden in the full flush of its beauty. We stand still, and survey the assemblage of plants before us. In one we admire the form of the foliage; in another the elegance of the blossom; and in a third the delicacy of the colour. Perhaps, too, we are pleased with the skill and the taste which have combined and harmonised the gay tribes so well together. But a botanist approaches and tells us—"There is a Primrose from Britain—an *Auricula* from the Alps—a White Broom from Portugal—a *Hepatica* from Canada—a *Fuschia* from the Straits of Magellan—a *Rhodanthe* from New Zealand—a whole troop of Annuals from California—a Peony from China—and a *Camellia* from Japan. Why, our flower garden has become quite a Noah's Ark, into which the wild

beasts flocked, and where they lived quietly together for a whole year. Very quietly and kindly, indeed, do plants live together, though sometimes the stronger suffocate the weak, as the thorns and thistles did the good seed in the parable. The flower garden exhibits, as it were, a congregation of plants; but when you begin to ask questions about their origin, and their native country, you suggest the subject of their distribution.

Let us make another supposition. Let us imagine ourselves in a large meadow, or field of natural hay ready to be cut down. Perhaps a friend acquainted with farming would say:—"There is a patch of Ryegrass—there is a tuft of Crested Dog's Tail, which withers into windle-straws—and there is the Yorkshire Fog (*Holcus*), which had better been away—and, worse than all, there is the Couch Grass or Quicken!" Perhaps even our agricultural friend would be surprised to learn that a botanist could find, possibly, a score of distinct kinds of grasses, and half as many other hay plants in that field alone. He would be further surprised to learn that there are at least 130 species of grasses, 110 of kindred rushes and sedges, and about 30 clovers, &c., in Great Britain. An instructed botanist knows all, or at least most of them, by head-mark; or if he meets with a stranger, he is uneasy till he makes out its name, and clan, and connections. Out comes his book, and he will spend perhaps a whole hour before he has finished his studies. It is this habit that makes a botanist such a wearisome companion to the unscientific lover of the picturesque. The latter cannot understand how a man should run mad about grasses or weeds, as he peevishly calls them. But the botanist heeds not this ridicule; he delights to give way to his enthusiasm, which, it must be confessed, is a very pleasing one. Take him to France, or to any other foreign country in Europe, and in the very first field he enters he finds numbers of new grasses, or other plants, which amply repay him for his travel. Or take him to some warmer region, such as Madeira, and he finds many finer things than grasses. He discovers the Myrtle growing wild; and the Oleander with its immense trusses of pink flowers; and the Coral-tree, something like our Laburnum, but in every respect finer, and with an amazing profusion of vermilion blossoms. Or land him at the Cape of Good Hope, and he observes the very rocks and sandy wastes covered with multitudes of what to him are rare species. One of the first impressions on the mind of a travelling botanist is the manifold and extreme diversity of the plants growing in the different regions of the earth. This feeling, as well as the general interests of science, has led to the formation of lists and descriptions of plants, as discovered in separate countries; and these lists, in their more accurate form, have been called Floras.

Thus we have a Flora of Scotland, that is, a scientific enumeration and description of the vegetable forms growing in Scotland; a Flora of Britain, of Germany, of Denmark, and so on. A comparison of such Floras has shed a strong and clear light on the geography of plants. For example, looking merely to numerical proportions, the

Flora of Great Britain exhibits between 2000 and 3000 flowering species or kinds of plants botanically distinct. The Flora of France is composed of about 4500. That of Nepaul in the East Indies includes upwards of 7600. There are many other numerical relations of great interest to botanists, but which are too minute and complicated to be mentioned at present.

Other curious facts emerge from a comparison of Floras. A Pea-flowering plant (*Astragalus*) for instance, grows or used to grow on the brow of a promontory overhanging the Forth, and it also occurs abundantly on the Ural Mountains, the boundary on the north between Europe and Asia. The little *Dryas octopetala*, which is frequent in the alpine parts of Great Britain and Ireland, may be gathered on the rocks of European Lapland, and again the wilder and more distant regions, bordering on Behring Straits, which separate Asia from America. So a little troop of plants not rare with us—such as the Dandelion, *Potentilla anserina*, *Prunella vulgaris*, *Plantago lanceolata*, and a few others—present themselves to the wondering eyes of the wandering botanist, on the lofty slopes of the Himalaya Mountains, affectingly reminding him of home. It would be easy to give numerous examples of this wide extension of certain species. The dispersion of mankind over the face of the globe has had to do with some of these phenomena. The common Chick-weed, the plague of our gardens, is rarely absent from cultivated ground in any part of the world; little tufts of it are found even on the high table-lands of Thibet. The common Couch Grass is said to appear wherever an European settles in Australia. The *Plantago major* so uniformly follows the settler in America, that the Indian calls it “the foot-print of the whites.” Perhaps the most curious instance of this kind of distribution is that of the Thistle of the Pampas in South America. Some of the white inhabitants of Buenos Ayres carried out from Europe the seeds of an annual Artichoke, cultivated in gardens as a culinary vegetable, under the name of Cardoons. It effected its escape into the unenclosed plains of that southern region, and soon occupied many thousands of square miles. This formidable Thistle sheds its winged seeds annually and then dies; but so suddenly do the young seedlings rush up, after the commencement of the rainy season, and so speedily do they complete their tangled and thorny growth, that they interrupt the internal communication of these countries, and have been known to arrest the march of troops. In these instances, and in some others, man has been the distributor of plants; but the great distributor is Nature; or to speak more precisely, the Author of Nature, the Creator and upholder of all things. It is His wise and skilful hand that has designed their forms, and stationed them in their places, and appointed the bounds of their habitations. As usual, he has embodied his creative and conservative will, relative to this class of his workings, in the form of laws, as philosophers call them. To some of these laws we shall advert in our next paper.

COMPARATIVE HORTICULTURE.

2.—THE CULTURE OF THE CHINESE AZALEAS IN FRANCE.

THE plants which belong to this section of the genus *Azalea* form charming bushes, branchy, and in general well furnished with leaves. From April to June these Azaleas are covered with a profusion of flowers remarkable for the beauty and splendour of their petals, varying from white to deep red, and vivid scarlet. By shading them, their period of flowering may be prolonged for nearly a month, and along with *Rhododendrons*, they are without doubt the plants best fitted for being kept in apartments, and for continuing a long time in flower.

Their culture, while not extremely difficult, nevertheless requires care. As soon as the flowering is over, it is necessary to re-pot them; they should then be left for a few days under glass, shaded, but with abundance of air, in order to recover from the effects of re-potting; after that they may be placed in the open air, fully in the sun, the pots being plunged to within 2 or 2½ inches of their upper edges. In re-potting, they should receive fresh peaty earth, light, sandy, and as rich as possible. To arrive at this result, many cultivators form composts of various ingredients and qualities. The choice of soil is certainly a condition essential to success. We have seen Azaleas, re-potted with indifferent earth, remaining whole months without making a single new root, and then perishing under the heats of July and August. The drainage of the pots is equally indispensable; it ought to be accomplished by means of a layer of crocks or pebbles, covered by a thin coating of fibres, obtained by beating pieces of peat earth. The presence of these peaty fibres greatly favours the development of the roots of the Azaleas; they are not always employed, but we have seen them attended with excellent effects.

Azaleas thus re-potted, and placed in full sunshine, and plunged as above described, ought to be watered with the greatest caution. Excess of humidity is fatal to them, and drought has also a rapid effect on their health. Sprinklings of water over the leaves are extremely useful in very hot weather, and abundance of water should, each evening, be poured on the pathways and on all the ground in the vicinity of the beds of the Azaleas. It is impossible to give precise precepts as to the keeping of these plants moist; it is only from a certain habitude, a sort of *coup d'oeil*, that one can arrive at good results. We must restrict ourselves to saying that excess of moisture is still more hurtful than dryness. An Azalea suffering from the action of the rays of the sun, recovers speedily when it is watered the same day; but an Azalea, whose leaves have grown yellow from too much humidity, requires a long time and great care to restore it to a right state. Planting it in the open ground is, in such a case, the best means of repairing its strength.

The choice of water for sprinkling and watering has also great influence. We recommend chiefly the use of rain or river water. The water of springs and pump wells may be very hurtful in consequence of the salts which it contains in a state of solution.

Azaleas managed as we have explained speedily form good roots, and are generally capable of resisting the direct action of the sun's rays, even in the hottest weather. Yet, when the heat becomes too violent, or continues for some time, it is prudent to shade them. During such heats, some of the growers at Paris have recourse to hurdles to shelter the plants whose leaves are suffering from the action of the sun. Besides, though a full southern exposure is adopted by all, we think that a half-shaded exposure should be preferred by amateurs. The flowering would probably be less abundant, but the plants would not demand such incessant care, and they would more easily maintain a vigorous vegetation.

This mode of culture is very economical, and when applied with care is attended with excellent results in the growth of the plant, and in the abundance and splendour of the blossoms.

In Belgium, and the north of France, a different method is employed, and succeeds as well—and we would suggest to amateurs to try it in the way of experiment, on some plants in their collections taking care to abandon it, or apply it exclusively, according to the results. Immediately after the period of flowering, the Azaleas are planted out in the open ground, in a compost of peat earth, and a little leaf mould; in this condition they can be left with impunity, exposed to strong sunshine, and they have less reason to dread the effects of damp. In addition, they require the same attention as those in pots, though a little negligence would not be so hurtful to them. This mode of culture is very simple, but not so economical as pot-culture; its main advantages are, that it calls for less assiduous care, that it imparts more vigour to the plants, and that, consequently, it enables the amateur in a short time to form fine specimens of each variety. In September they are repotted, and treated as those permanently in pots.

The most convenient place for them to pass the winter is a Dutch Pit [*i.e.*, a cold pit, capable of being occasionally heated by the introduction of a small portable stove] kept rather moist, and heated only to prevent the entrance of frost. Azaleas are fond of light; and therefore the use of mattings may prove injurious to them, if it is too much prolonged. On that account, by means of moderate heat, a minimum temperature of 38° or 40° should be maintained. It is better to place the pots on clean sand than on shelves or planks of wood. Under pain of seeing the plants perish, we must be as reserved as possible in watering, and we should employ water which has been kept for a time in the pit. Air should be given as often as the temperature permits. Thus spring is reached with healthy plants, covered with buds, which ere long begin to swell, and which soon open under the influence of the early warmth. For the most

part, Azaleas are kept under glass till the end of the flowering season. We have, however, remarked that plants brought out as soon as there is no danger from frost, blossom a little later, indeed, but produce flowers more sparkling, and with more vivid tints, and which remain quite as long in their glory, provided they are re-introduced into the greenhouse at the period of flowering.

Azaleas yield readily to training, and assume any forms that are desired. To obtain fine specimens it is needful to commence treating them when they are very young, and to guide the sap in such a way as that it may not mould itself into such undesirable forms as may be very difficult to rectify at a later period. Pinching may be performed at all seasons; but it is after the flowering and when the shoots are pushing that it can be best done, and without injury to the subsequent flowering. By a skilful use of pinching, an equilibrium of the sap may be kept up, and perfect shapes may be obtained. In France and Belgium Azaleas are pinched very short: in England, on the contrary, they are kept rather long, and by the help of sticks and ties are formed into globes, pyramids, sugar-loafs, &c. The latter method of training is much the more difficult and minute: we advise amateurs to follow the French method, without, however, pushing it to excess.

Azaleas are chiefly multiplied by grafting either by cleft or whip grafting, or by approach. They can also be propagated by layers, by cuttings under bell glasses in a hot-house, and by rooted suckers. It was, above all, by the sowing of seed that we have gained those beautiful varieties which are the ornaments of our collections.

Lastly, let it be remarked that the most of the species which are confounded under the common name of *A. Indica*, are perfectly capable of resisting our winters, and that at no distant period, these fine plants will be seen taking their places in our masses of ornamental shrubs.—*Le Bon Jardinier*, 1857.

BEDDING OR MASSING FLOWERS—THEIR PROPAGATION AND CONSERVATION.

BY MR R. ERRINGTON, OULTON PARK, TARPORLEY.

THE readers of the *Scottish Gardener* who cultivate bedding flowers must be aware that success depends in no small degree, on the character of the plants in spring. It is from the want of a full recognition of this fact that so many unsatisfactory and anomalous cases occur. It is not that the matter is beset with high difficulties, albeit caution and management are requisite. To have a half-blighted, half-starved parterre at Midsummer, or one rich, elegant, and conveying every sign of exuberance, are two very different affairs. One of the principal faults as to the bad character of bedding stock in the spring, is delay in the matter of propagation

during the previous summer. Late propagation cannot possibly produce that strength of constitution in the plants, which will enable them well to withstand a trying winter. They are short of roots, and what they have, possess so loose a hold on the soil that the plants, if kept rather dry at the roots, as all bedding stock should be, are apt to wither up, to shank, or to become infested with a kind of vegetable gangrene, which causes the plant to shrink into very small dimensions. One of the preliminaries necessary to success is a proper condition of wood, as gardeners term it; or in other words, the shoots from whence the cuttings are made. The difference is immense between shoots under different circumstances. Let any one try the Pansy for instance; let cuttings be made from exhausted long-jointed and blossoming shoots, and let them also be tried before they have become exhausted with blossoming, and the difference will astonish those who have not taken the matter into consideration. Many of our bedding plants produce very gross and watery shoots towards the end of August, and become very unfit for propagation purposes; to say little of the lateness of the season. Such plants as *Heliotropes*, *Calceolarias*, and *Geraniums*, besides many more, are illustrations of this fact. Most of these things begin to put forth side shoots below the upper portion of the stem in the end of July, and these are the most desirable cuttings in general; therefore the following maxims will be found worthy of consideration by those who have not well considered the subject:—

1st, Endeavour to obtain cuttings free from the blossoming principle.

2d, The shorter jointed the better.

3d, Obtain them if possible by the first week in August.

The reasons for the above will be found as follows:—The blossoming principle is exhausting—has a tendency to empty the shoots of that property which is of eminent assistance in the production of roots. As to short jointed shoots, such is a general criterion of fruitfulness in all fruit-bearing trees; an evidence of a considerable fund of assimilated or elaborated sap—what a commercial gentleman would perhaps call stock in hand—such is also readily contributable to the production of fibres. And now as to early propagation. It will be readily seen that two important considerations are concerned in this matter; proper shoots, and a peculiar strength of constitution adapted to withstand the rigours of a long and perhaps severe winter. Let me therefore exhort the uninformed to keep an eye on such things. I will now proceed a little further as to matters connected with their future welfare. It may be asked, what is the best plan and place in which to carry out propagation matters of this class and kind? So much depends on the position and chances at hand of the lady or gentleman desirous of doing all their means will allow them in this way, that it is not easy to generalise a plan securing the welfare of the whole. Those who can spare a common

garden frame will do well thus to employ it ; turning its face to the north. Others must take refuge in hand-glasses, and there are those who use inverted garden pots. No bottom heat is required, the only care requisite is to keep the cuttings near the glass, and constantly a little moist, and to shade them from the solar rays from eight A.M. to five P.M. As to the matter of shading, there is, as our readers in general know, such a thing as Shaw's tiffany, which is sold by every respectable seedsman, at 5s a piece, 20 yards, 1 yard wide. This, albeit not very durable, is very good shading for such a frame with its face to the north ; southern lights or hand-glasses, need it double in fine summers.

But there is another plan available to those whose means are severely limited—the use of shallow pans or flat garden pots. Pans about nine inches wide at top would contain a goodly lot of cuttings, and the latter being dibbled about three inches below the rim, a piece of tiffany or other light shading might be laid on the top, securing it against the wind. If trouble be any object, by such a mode, and that described for the frame, the tiffany might remain on day and night for a while without any material injury.

The next thing I may name is this ;—there are some things that will propagate without either glasses or shading. Most of our ordinary Geraniums will succeed pretty well in this way, providing the shoots are tolerably compact and the site for planting them properly chosen. As for the scarlet section in general, they really require to be somewhat punished, if I may use such a loose term ; especially if gross and flabby when taken from out-door plants. Such is not unfrequently the case, and I have known gardeners after cutting them off throw them in the shade of a wall for a few days, as though they were drying herbs. I am unwilling to urge any extreme of a suspicious character on the readers of the *Scottish Gardener*, inasmuch as the inexperienced may be led astray : let the hint, however, be received in a moderate way, and the practice qualified accordingly. Some of our popular writers insist that the best way to propagate these gross growing Geraniums is to dibble the cuttings in on a south border, in the full sunshine, leaving them to their fate. But this practice must be received with some little caution. Perhaps the best advice to amateurs would be to put them in a half shady situation, with a few boughs amongst them thinly for about a fortnight or so, and then to remove the boughs.

But there is another class of Geraniums now pretty well known, called the fancy kinds, and for which we may in some degree thank our friends the French ; these will scarcely submit to the same rough handling. They do not produce such succulent cuttings as the ordinary kinds, and require a different mode of propagation. The cuttings are impatient of either much cold or of much heat with air moisture, in a confined position ; the open border system will scarcely prove suitable to them. Some say that it is best

to excite old plants into young wood in February, and to propagate the sprouts from them with all possible expedition. Such I know to be one good plan, but not every one has the chance. Let us suppose, in order to proceed with our subject, that the amount of bedding stock has been propagated, and that we have arrived at the beginning of September: I will now point to their autumn management, which requires a little consideration. By the first or second week in September many will be ready for putting into pots, and what are called store pots are best for this purpose. Such should be wide at top, and shallow. As soil, I have found nothing equal to a good sound loam to which a little sand or the charred material of the rubbish yard is added: this should be well broken and mixed, and the pots should be thoroughly drained. Some years since I used lighter composts, but it was certainly a mistaken practice. One of the main points is to put the plants in a position to withstand the effects of drought at the root; for the drier they are kept during winter the better. If they are potted in loose light and incoherent soil they must occasionally have water; but well established in a sounder soil there is little need for it; in a dry state the plants will resist the attacks of frost much better than when damp, and that kind of vegetable corruption to which such things are so liable when long confined is avoided. The plants being potted should be placed in a perfectly open situation out-doors for a while, in order to become hardened—a process somewhat similar to what is termed “ripening the wood” in fruit trees; and this with bedding stock is accomplished best by a full exposure to light, a limitation as to moisture, and a comparatively low temperature. Under such circumstances, there is no harm in submitting them to a degree or two of frost: it will just check their exuberance, and enable them better to meet the vicissitudes of a long winter.

In order, however, to get them in a tolerably dry condition at root, they should be got into their winter quarters by the middle of October. Whether such be frames or pits, there needs a little preparation. In the first place, they should stand on, or be plunged in, a material not capable of engendering vegetable gangrene; in the second, they should be kept near the glass—and in addition, the frame should have a slope towards the south. I use cinder ashes, but to those who can so manage it, I dare recommend the charred material of the rubbish yard, as being somewhat antiseptic in character. I will now suppose these practices carried out, and the period arrived at the middle of November. This brings me to hints concerning winter management. The old practice—and one perhaps still somewhat general—was founded on an abhorrence of low temperatures; this led to a coddling kind of system—the plants being kept growing all the winter. But the very converse of this is what we must aim at, the chief point being to get them in a kind of stationary condition by the end of November. To accomplish this, a temperature of 30° to 40° is necessary, and this is easily attainable in general in

the winter season, by giving a liberal ventilation on all necessary occasions, and in cases of severe depression to cover well with mats, litter, &c.

One thing I must here name as regards wintering store plants during long continued frosts. It is a very common practice to adopt, but one maxim is, that of preventing them from freezing if possible. Now, that 6° or 8° of frost would do them some little injury is probable enough, but there is even a greater probability of their suffering from damp in a confined condition. And thus it becomes a sounder policy on the whole to allow them to freeze slightly at the commencement of a frost that threatens to continue a week or more. This is my practice, and I recommend it, — certainly in preference to any coaxing or coddling system. In such cases, I have had stores covered up with mats, litter, and not unfrequently a thick casing of snow, for a fortnight continuously, and without the slightest damage; but caution is necessary under such circumstances as to a thaw. Most persons know that sudden thawing in the matter of a frost-bitten limb is not right, and we find it to be very similar in the floral kingdom. Slow thawing, then, is the maxim. If I had a case of this kind, the plants having been frozen slightly, and covered up day and day night for a fortnight, and a regular thaw intervened, I should by no means uncover the first day; I would simply tilt the lights about an inch or so for nearly twenty-four hours, and the next day I would remove the covering, but shading a little during sunshine. On the third day any amount of ventilation would be given according to circumstances, and thenceforward they would receive ordinary treatment.

The intelligent readers of the *Scottish Gardener* will readily perceive the reasons for adopting what, to some, may appear an odd course of procedure. To be more explicit would be tedious, and, indeed, demand too much room in its valuable pages.

SHANKING OF GRAPES.

BY MR A. CRAMB, THE GARDENS, TORTWORTH COURT, GLOUCESTER.

(Continued from page 305.)

THE present communication does not admit that I should say anything regarding the best and most economic system of distributing heat among Vine roots, the subject itself being of sufficient magnitude to form a separate article. But during an emergency such as I have described, immediate steps should be taken to supply heat to the surface of the border, by the use of fermenting material, to promote within the least possible time the restoration of spongelets.

I do not say that the application will entirely subdue the disease,

but it will mitigate its virulence, and keep it in check, till arrangements of a more substantial character can be made. We occasionally meet with objectors who argue that surface heat is a positive injury, and to support their position, will scrape together numerous invalid reasons, somewhat in the following form:—"Admitting," they say, "that heat possesses a regenerating power, my Vine roots are too deeply rooted to be within its reach, consequently it is perfectly useless for us to bestir ourselves." So with this soothing and consolatory idea that nothing can be done, they allow themselves to be lulled into a still deeper sleep, and are contented to submit passively from year to year to an incubus, without making a legitimate effort to throw it off, whereas the soil could easily be removed to whatever depth is necessary, and there need be no apprehension of scorching the roots, as they will resist a greater amount of heat than many persons are aware of. But to throw the subject into a more practical form, I would state as concisely as possible what has enabled me to cure Grape shanking. Cases might be multiplied, but one of an aggravated form treated successfully, carries as much weight as to enumerate a hundred. A year or two before I took charge of the gardens here, a border had been made for white Muscat Vines, but so contrary to what is usually met with, that a few particulars regarding its formation may be necessary. The subsoil, a strong retentive clay, was removed to the depth of four feet, and the bottom finished without giving a perceptible incline to carry off the surplus water; six inches deep of stones, about the size of road metal, were laid over the surface, and concreted all over, without providing an outlet of any kind for the discharge of aqueous accumulations.

The quality of the soil that formed the border was faultless, but what of that, as neither its chemical ingredients, nor mechanical arrangement, could serve any useful purpose when overcharged with water.

So circumstanced, more than half the roots perished annually, and scarcely any of them escaped without injury. Supposing, then, that we leave their restoration to be effected by the power of solar heat, which cannot occur till the end of summer; and this is easily believed, from the fact that water stands at the head of radiating substances, proved years ago by the late Professor Leslie, and still maintained as a standard opinion by modern philosophers. In a general way, we have not a clear conception of the amount of heat that certain vegetable and animal forms thrive in. Persons who have read Dr Hooker's Indian journal, may remember of him saying that *Confervæ* luxuriate in a stream from hot springs at a temperature between 168° and 90° ; of a Cypress growing luxuriantly with its roots in water quite as high; and of frogs and beetles frisking about abundantly in water at 112° . But to return to the Vine border. Before I had thoroughly become acquainted with its condition, I had conceived it possible that shanking might be cured by coaxing the

roots to the surface of the border, and to a certain extent was successful, but the remedy was by no means conclusive. As the last alternative I determined to lift the Vines and clear out the soil, when I found my worst anticipations verified. For this operation, perhaps, there is no period of the year so suitable as the beginning of October, as the heat of the soil then averages from 55° to 60° at a foot deep, while by the end of the month, it has sunk to about 40° . Heat facilitates the formation of callosities on the mutilated part of the roots, which prevent further decay. I did not think it in any way advantageous to disturb the concrete, beyond making accommodation for the discharge of water, and had the space filled with stones to within two feet of the surface. The depth here allowed for soil may be considered too limited, which is not my opinion. I have made some of our Vine borders here only twenty inches deep, and as shallow as eighteen inches. I have long thought that the quantity of soil should be increased by giving an extension of surface to the border, in preference to its depth. It sometimes happens that the surface of the garden possesses an incline towards the Grape houses, which carry, during storms of rain, an injurious quantity of water into the border, and to prevent such an occurrence, a stone wall, 15 inches wide, should be made just inside of the box edging, which destroys the possibility of saturation from that quarter; at least I have been in the habit of doing so, and have found the plan very effective. To bring the roots within the reach of atmospheric agency, I had them laid within eight inches of the surface among decayed leaf-mould, which is, perhaps, the best material we can select for such a purpose.

The border was then protected against the admission of wet and frost by a covering of fern and stable litter. Being treated on the spur system, each shoot was pruned to a couple of eyes, to prevent any nutritious expenditure, for although there may not be a sap circulation, there exists a sap motion during the period of repose, unless when the plant is absolutely frozen.

It is an admitted fact by the generality of well-informed gardeners, that the growth of the roots should always be considerably in advance of the branches, and it is also the correct reasonings of theory. During the first week in January, I had heat applied to the surface of the border, and kept the soil constantly at a temperature of about 90° . The branches were allowed to vegetate by the force of sun heat, and when the bud began to swell, the night temperature was steadily maintained between 45° and 50° , and the increase of heat was just in proportion to the progress of vegetation; for were it otherwise, that unity of action, which ought to exist between the roots and leaves would be disturbed. Each Vine was allowed to carry from eight to ten bunches of fruit, averaging individually about two pounds weight, without a shanked berry, and much about the usual size.

Throughout the summer, the leaves showed no signs of flaxidity,

but on the contrary, continued to acquire a rather unusual amount of vigour, and by the end of the growing season, the major part of the spurs were two inches in circumference. Now, whatever opinions may be formed regarding my statements, I can safely assert that previously I was not able to produce a sound bunch, and more than three parts of the crop were perfectly useless. This is the second season since the Vines were lifted, and they are just now ripening a heavy crop, without the least appearance of having a shanked berry. I have long considered that successful Grape cultivation, rests principally upon the following points :—Perfect drainage, the protection of the roots from rain during repose, the application of heat to the border, and well matured wood. I am aware that shanking may be produced by over cropping, a sudden exposure of the roots by the removal of the fermenting material, or chilling the soil by cold water. There may be a few more disturbing causes, but they occupy a very subordinate position.

A FEW BRIEF HINTS ON THE PROPAGATION OF SOME OF OUR MOST POPULAR BEDDING PLANTS.

BY MR D. THOMSON, DYRHAM PARK, HERTS.

THE season having now arrived when the propagation of bedding plants must be commenced in earnest, probably a few brief and simple remarks under this heading may not be unacceptable to some of your readers, especially amateurs, who either do their own gardening only or employ an inexperienced assistant ; and if the more experienced gardener should be able to pick up a few crumbs from our jottings, even to such our feeble effort shall not be in vain.

Generally speaking, a vast amount of unnecessary labour is expended in connection with this branch of gardening, in the way of making up hotbeds and providing plunging materials for bottom heat, and so forth ; the idea of which is alone, in many cases, sufficient to prevent the amateur from a successful attempt. But, after all, the means referred to are, generally speaking, more injurious than otherwise, and the writer has for years entirely dispensed with stinking hotbeds, or any other means of artificial heat in the propagation of flower garden plants in autumn ; and the locality is by no means a favoured one, either in soil or climate.

Scarlet Geraniums.—How frequently these are propagated, or rather tormented to death, in warm, close, and damp pits or frames ; some even go the length of stewing them alive in bottom heat. The easiest and surest way is to strike these in the open air, exposed to the full sun. Choose strong short-jointed cuttings from round the outsides of the beds or plants that are singly in borders ; avoid taking only the mere points of the growths, and let the cuttings be strong and firm at the base. These, if inserted moderately thick in well-drained

pots or boxes filled with a rich sandy soil, will root freely in the open air. We never lose one out of a hundred in this way, and when housing time arrives, they are vastly more robust, and less likely to suffer from any injurious cause through the winter. In the *Scottish Gardener* of last August full and minute directions are given in an article on the propagation of the Scarlet Geranium, and how to winter a large quantity in a small space; and to which article the attention of the reader may be directed, as suited to his case if he has a large flower garden to fill, with a small amount of glass—a thing, by the way, which is very much too common in the present day. But before dismissing the Scarlet Geranium, it may be remarked, that where room is ample and an early summer display is required in the flower garden, the best way to accomplish this is to lift all the old plants, and put those which he propagates singly into 48-inch pots early in the season, and plunge them out-doors for the autumn: those managed so, and wintered in vineries where frost is excluded, make a much finer display earlier in the summer than those managed in the common way.

Variegated Geraniums, such as Flower of the Day, Alma, Mountain of Light, Miss Dolby, and others, may be managed in the same way as the common Scarlets, in as far as the selection of the cuttings, &c., goes; only, as most of them are less succulent and vigorous than the Scarlets, it is best to place them to strike in some open and airy structure where the intense rays of the sun can be kept from them till they make a few roots, when they should be immediately turned out-doors till housing time.

Verbenas.—The *modus operandi* that we pursue in propagating thousands of these is to well crock the necessary number of 8-inch pots, placing a layer of rotten dung over the crocks, filling up the pot with a mixture of loam and leaf-mould to within an inch and a-half of the brim, which is made up with half peat and silver sand: in these from fifty to sixty cuttings are inserted. They are then placed in a frame or pit—such as a completely exhausted Melon bed; kept close and shaded from the sun during the day. The lights are entirely drawn off during the night, except when heavy rain is feared. In this way, if the cuttings are the least inclined to flag through the day in hot weather, they are completely revived by the night dews. It is a great mistake to choose the mere tips of the growths for cuttings. If you will look over your beds after rain you will see the disposition to emit roots some three or four joints from the top; and if large cuttings are chosen, and the tips pinched off when the cutting is made, they root sooner and make stronger stuff than otherwise. After they are rooted, let them be gradually hardened off or inured to the full sun, and placed out-doors for a week or two. In this way they become robust and hardy, affording a desirable contrast to those struck in a high temperature and in bottom heat, being kept close night and day: the result of which is a very much debilitated plant before they even emit roots; and after

they are rooted they take a deal of nursing to bring them round to anything like a robust condition.

Shrubby Calceolarias.—The propagation of these is often attempted far too early in the season, and too often handed over to the tender mercies of a dung bed or a steaming propagating house; and we have not unfrequently gazed upon them in such circumstances when very little of them could be seen for a mass of what is well known to our craft as "mould." When taken at the proper time, and placed in cold frames, this useful plant roots like Musk. By waiting patiently for autumn rains, when these are mostly done blooming, and they have made abundance of fine fresh shoots, and taking the cuttings then—say the first week in October—and making them in the same way as a *Verbena* cutting, and inserting them in the same sort of soil, they will root freely, and that without a loss of one or two per cent. While they are striking, preserve them carefully from direct sunshine, and always leave a little air on all night.

Cineraria Maritima.—This beautiful plant is now becoming extensively used for edgings and for ribboing, and is a great favourite with the ladies. It is somewhat shy in rooting in autumn, but strikes freely in heat in spring. The best way to manage it at this season is to go over the plants early in August, and give the side shoots a "nick" with your knife—very much in the same way as when layering a *Carnation*; and if you choose it, can be layered in a little light soil, or if left for a week or two the cut will be calloused, and the cutting taken off and put in sandy soil in well-drained pots, and the calloused part will soon emit roots.

Salvia patens.—We never trouble ourselves with cuttings or roots of this plant. The easiest way is to save a good large packet of seed, which, if sown in the first week of February, makes fine strong growthy plants by the middle of May.

Double White Feverfew.—The same as *Salvia patens*—only it is not necessary to sow till March.

Salvia fulgens.—Cuttings taken in September, and managed precisely the same as directed for *Verbenas*, root freely.

Ageratum Mexicana.—The dwarf variety of this—which is by far the best—seldom seeds, and consequently it must be increased by cuttings the same as directed for *Salvia fulgens* and *Verbenas*, choosing the young growths which come from the bottom of the old plants about the middle of September.

Heliotropes.—The tops of strong growing shoots of these strike freely in pure sand, placed in a cold frame, and managed the same as *Verbenas*. But as it is desirable to pot these, and get them established in small pots before winter, the cuttings should be taken not later than the first of August, and if in the end of July all the better.

Anagallis.—Choose the young side shoots of those that have least bloom buds on them, and make the cuttings rather short, choosing

the top of the growth. Inserted in pure sand in well-drained pots or pans, they root freely in a cold frame.

Agathea celestis.—The same treatment as recommended for *Heliotropes*. It takes a good while to strike at this season, and should also be got in early in August.

Dwarf Lobelias.—Such as *Gracilis*, and the different varieties of the *L. erinus*, run so completely to flower shoots if the season be dry especially, that cuttings are difficult to get. The best way to do with them is to lift a few plants of the sorts that do not seed freely and propagate from them in spring.

Dwarf Dahlias.—Short wiry cuttings of these root freely at this season in pure sand. The earlier in August they are attended to the better, as it is desirable to pot them off and get them established in small pots before winter, and if kept warm and dry through the autumn, they will fill their pots with roots. This is a most useful class of bedding plants, and as different and distinct coloured varieties are introduced, they cannot fail to be extensively used in all flower gardens of any consequence.

Petunias.—These, treated precisely the same as *Verbenas*, can be increased with great facility.

Space forbids enlargement at present; and as the plants named form the bulk of those in general use for decorative purposes, it may perhaps be unnecessary to extend the list.

Just a word or two on "lifting" and wintering old plants of *Geraniums*. We often meet with the most absurd management of these—a case or two in point will perhaps best illustrate the truth of this assertion. The gardener of a noble lord lifts a thousand or two *Scarlet Geraniums*, pots them—after "cutting them back"—places them on the floor of a large vinery, where a fine crop of *Grapes* is hanging. He *slunges* the plants well in the water when potted, and every time they look thirsty, till he kills them, and ruins his crop of *Grapes*. Another lifts them, puts them in a damp pit, and to make matters worse, *waters* and *fires*, *waters* and *fires*, till he has nothing left but *foggy* stumps, and at their tips a few weakly leaves. The amateur falls into the same error, because he is set the example by the profession. Now, if that which is practised by hundreds of intelligent gardeners were followed in this case, viz.:—To lift the plants, strip off a few of the largest leaves that are likely first to decay, pot the plants firmly in pots large enough to hold the roots, never give any water at all—not all the winter—the plants would not only winter well in indifferent situations, but would acquire such an amount of irritability that when spring arrives and water is called for, they acquire an amount of stamina which enables the gardener, short of space, to accommodate them in not the best of quarters with impunity.

Such as "Flower of the Day," "Golden Chain," and "Mountain of Light," are easily preserved in this way; while treated as referred to, certain death to a host of them is certain.

We are aware that many consider it quite unnecessary at this time of day to write about such apparently simple matters as these. In the case of many it may be so, but they are very ignorant indeed of matters as they are, who do not know that in hundreds of cases, advice is still called for in such matters.

HOT WATER CIRCULATION.

BY MR J. ANDERSON, GARDENER, MEADOWBANK, UDDINGSTONE.

I had no intention to trespass on this subject in your columns, until reading a criticising article on certain remarks which appeared in your June, and subsequently rectified in your July number from my pen; but I cannot help expressing my surprise that the very sound advice which the writer prefaces his remarks with, has been partly lost upon himself. He goes on to read us a very fine lesson on practical as well as philosophical science, and one is almost led to believe that he is no mean adult in these branches, until reading his closing remarks, which contain two hypothetical theories—two theories that seem to me to be so ridiculous—pardon me for the expression—that when I had finished the article, and glanced at the signature, an idea forcibly struck me, that you, Sir, might have made a typographical mistake, and that the writer, so much alive to his own humoursome failings, had styled himself “An old Joker” instead of “An old Stoker.”

The first theory is, “that if the boiler and pipes were properly balanced, there was no such thing as boiling in the boiler at all;” and the second one follows, “that such was not at all necessary to a most rapid circulation.”

I admit that it is perfectly possible to heat a house or houses without boiling water in the boiler, where no great application of fire-heat is required, unless during the winter months, to keep out frost. Such instances frequently occur. I admit it is absolutely necessary that your boiler should command a greater degree of power than what is required under ordinary circumstances; but I do not admit, and for the life of me I can see no grave objection why we ought to curtail its power before it comes to the boiling-point. Will any one tell me, with all our improvements on heating, with all the nicety of gradual and continuous circulation, that we can heat from one to two thousand feet of piping, keeping up all the respective houses at proper temperature, without boiling the water in the boiler? In summer time we may. If one boiler then can heat one or more thousand feet of piping efficiently, with little more tear and wear than another one heating as many hundreds, if you have houses to heat, why not prefer the more comprehensive, though at the same time, the most simple method of the two? What an amount of extra stoking labour saved! What a difference in your coal account! In short,

what considerable retrenchment in gardening expenses, simply from the managing of one fire in place of eight or ten. This can be easily accomplished by means of valves for shutting off and letting on the circulation; and I may here mention that there is no such difficulty in procuring perfect valves as some writers seem to despair about. We find here a perfect stop in "Combe's throttle valve." It may be argued, supposing anything goes wrong with your boiler, and the thermometer standing low out of doors, you are completely lost. There is a remedy for this in the substitution of *two* boilers instead of one in your stoke-hole, and both connected to your heating apparatus. This, undoubtedly, is a very wise proceeding on the part of those who go to the extra expense. But supposing you have but five houses to heat from the one boiler, and three out of the five kept at high temperatures, are you, according to the theory laid down, to keep slow fires, afraid you should boil the water in the boiler; or, are you to fire as rapid as the circumstances may demand? and still, with such hot work, no appearance of the water boiling? In short, is the boiler with a central flame playing upon its surface, with not two hours', but one hour's strong heating, to become a receptacle for water which does not know the way to boil? The idea is preposterous. But is there any danger incurred from boiling the water in the boiler? I maintain, where boiler and pipes are properly balanced, where your expansion box is placed high enough above your boiler, and an air-pipe communicates between the two, there is not the slightest danger. Before dismissing this theory, I may give an instance of a boiler that at one time heated our orchidaceous house, and I can assure you it was fine mornings and evenings, indeed, when this strange piece of material did not boil the water in its interior. I am inclined to call this a funny boiler, and probably your readers will think so too. It was very soon condemned, and when brought to light was nothing more or less than a common pot, such as is generally used for boiling horses' meat in; but to complete the sham, it was attached to pipes of two-inch bore, and these pipes laid not even on the ground level of the house, but below it, the top of the pipe being level with the path. We have now a saddle boiler that heats that same house, and five others along with it, with far less labour, and with infinitely less proportionate quantity of fuel; but to keep these houses at proper temperatures, the water frequently boils in the boiler.

And now we come to the second theory, which we will dispose of as briefly as possible, viz.—"that such *boiling* was not at all necessary to a most rapid circulation." Water at 40° is supposed to be cold, and requires to be excited by some combustible material before it will circulate, but if you excite it to 100° , we will say, for the sake of argument, that that will produce circulation; if farther excited to 150° , that will produce more circulation; and if further excited to 212° , or the boiling point, that, of course, will produce a most rapid circulation. Now, "an Old Stoker" agrees with me, that there is such

a thing as circulation, and for aught I know to the contrary, he believes in rapid circulation, but he most explicitly declares that water excited to 212° is not at all necessary to a most rapid circulation. It was always my humble opinion, and yet remains unchanged, that the greater the heat, the more rapid the circulation.

There can be no doubt at all that it is a very injudicious, if not a rash step, to have the 'water boiling' in the pipes of houses where plants or Vines, or whatever the case may be, are immediately above them. Such treatment is not very natural; but it is one thing the water boiling in the boiler, and another thing altogether the water boiling in the pipes. We have to descend the scale of graduation in order to criticise their relative temperature. But again, you may be necessarily obliged to place your boiler at one end of a range of houses, and it may sometimes occur that your hottest houses are towards the further end of such range. Well, how would such houses be most effectually heated? Not certainly by an indirect communication, but *vice versa*. Then you require to have a direct flow and return pipe to these houses, not in any way interfering with the houses proximate to the boiler. This will require a subterranean chamber finished as air-tight as possible; and it will be found all the more economical to insert a cold air-pipe into this chamber to force the heated air into an open vacuum. I see no great harm although the water should boil part way in these pipes, if intense frost should set in, and you require it. I happen to have made that experiment already, and would do so again without much fear, because I have formerly proved, for my own satisfaction, that our boiler and pipes are properly balanced, and that boiling the water in the boiler is essentially necessary to procure the most rapid circulation.

A FEW WORDS ABOUT THE GOOSEBERRY CATERPILLAR.

BY MR A. FOWLER, CASTLE KENNEDY, STRANRAER.

PERHAPS no fruit is so generally cultivated in Scotland as the common Gooseberry, *Ribes grossularia*. It is to be found alike in the gardens of the peer and the peasant, a favourite with all; and, perhaps, in no part of the country is it to be found more productive, or to be seen in greater perfection, than in Wigtownshire—the soil and climate being unusually favourable for its healthy development.

If it has fewer diseases to contend with than most other fruits, it suffers more from insect enemies, particularly the Gooseberry caterpillar, which feeds upon its foliage, often entirely destroying it. When this occurs, the fruit does not ripen, dropping off prematurely, not only sacrificing the present crop, but injuring the plant for future years

There is something extremely disagreeable in appearance, and offensive to the eye, when Gooseberry plants are seen in this denuded state.

There are three species of caterpillar which attack the Gooseberry—the magpie moth, *Phaeloena grossulariata*; the small magpie moth, *Phaeloena vandria*; and the Gooseberry saw fly, *Nematis tramiculatis*. As far as I have observed, I find that it is nearly exclusively the latter species which attack the Gooseberry in this locality, and, I believe, generally throughout Scotland.

Entomologists tell us that the caterpillar of this species descend into the earth in the autumn, burying themselves within a few inches of the stem of the plant, on which they had previously existed, where they remain till the following spring, when they emerge from their winter abode, impelled by that same power which pushes forth the budding leaf and the opening flower.

The chrysalis now changes to a fly, and soon after the female begins to deposit her eggs on the under side of the leaves, choosing the sides of the *nervures* as a fitting place. With the saw-like appendage for which this family is remarkable, the females commence cutting into the leaves and stalks, and in the openings deposit their eggs. The larvæ become hatched in about seven or eight days, and commence feeding on the leaf, which is speedily anatomised, increasing in size, and frequently changing their skin, until they are about three quarters of an inch in length.

The broods of caterpillars appear in succession, occasionally from March to September, but generally in greatest numbers in May and June. Sometimes they severely attack the Gooseberry in July and August, and after denuding the plants of their foliage, descend into the earth, to reappear in the fly state the following spring. Those of the early summer brood descend in like manner, but in course of three weeks, or even less, undergo their transformation, and again appear as perfect flies.

Many plans have been suggested to prevent the ravages of this destructive insect. I have tried many, but with indifferent success, until I adopted the by no means new but very reasonable one of removing the soil around each plant, three or four inches in depth, and about two feet in diameter, and with the soil the chrysalis, the agents which supply the guests for the feast, nature provides in due season. The whole should then be buried eighteen inches or two feet in depth; the bottom of a trench will be found a convenient place, and fresh soil added in place of that which has been removed, which will much assist in renovating the plants. If carefully done, this process need not be repeated oftener than every second or third winter.

To all who grow Gooseberries, either on a large or small scale, I would say, *try this very simple and economical plan*. My own experience enables me to speak with certainty as to the result.

FIRST-CLASS GARDENERS.

Let us first see what constitutes a *real gardener*, many scores of which may be found in the British Isles—as for our continental neighbours, who deserve honourable mention, we must leave them for the present to fight their own battles, which they are perfectly qualified to do. Such gardeners as I am now describing, in common with other professions where eminence is attained, are an honour to the country they spring from, and not unfrequently confer benefits on a succeeding generation: and, albeit not so profound in scientific matters as those who spend a life amongst them, and receive a special training, will be found to know enough of each science to attempt and make rational their course of practice. Vegetable physiology, botany, meteorology, the first principles of mechanics, geography, and climatical matters, landscape gardening, &c.,—these have all received as much consideration by the real gardener as will prevent him from pursuing blindfolded, mere rules however important they may have become through long usage. Thus, in physiology his mind is well imbued with considerations on the structure and functions of plants; the causes which predispose to the formation of wood in trees and shrubs; and, *vice versa*, the rest necessary for plants according to their kind; diseases, their cause and remedies, &c. In botany he has well examined the two systems, and especially the affinities of plants, by which he is led to readily infer the habits and character of any novelty, its botanical character being once fairly ascertained; as also, thereby, much to group and facilitate business. In meteorology he has studied those laws which are known to govern the motions of heat, air, and moisture, as bearing on the constitution of plants. In mechanics he is tolerably conversant with those simple maxims which teach him to use the power within his reach with as little loss as possible. In geography, he has, of course, ascertained the character of the globe as regards climates, altitudes, &c., and has well studied the effects of extreme climates on vegetation, and well marked Nature's grand plan of adopting forms, habits, &c., to the climate for which particular plants are specially intended. Last, but not least, landscape gardening. Here the real gardener has great scope to show his abilities. One who has studied Price, Repton, and others of that class, and learned to appreciate the fine works of celebrated painters, and also well warmed his fingers with actual operations, has attained one of the highest points in his profession, and is qualified both to design and to execute in matters of taste. More, much more, might be said for the real gardener, and I am not assured that it takes more time, thought, and perseverance to make a Lord Chancellor than a first-class gardener.

E.

THE POINSETTIA PULCHERRIMA.

I WAS in hopes that some one of your numerous and clever correspondents would have replied to the enquiry that came from Suffolk (see page 265), especially that part of it which refers to the culture of the *Poinsettia pulcherrima*; because I might have learned something myself from such a communication, for I readily own that I am by no means satisfied with any of the various methods that I have seen adopted and carried out, or with the plans detailed and recommended from time to time in the various publications of the day. The *Poinsettia* is a fine old plant, introduced from Mexico as far back as 1834. Its true flowers are a mere nothing so far as display is concerned; but the floral leaves which surround the flowers at the points of the young shoots are of one of the richest tints in nature, and the plant is greatly admired on their account. Another good quality of this old plant is, that it remains fresh for a very long time after it is cut, when placed in water: so that it is a very desirable plant for those who have to furnish a supply of cut flowers to the drawing-room, hall, or some other place. Its value is still farther enhanced by the fact that it produces its highly ornamental heads in the cold, dark, dreary months of winter—a time when anything possessing colour is really valuable for cutting. But this plant has its faults and failings. The real fact of the case is that the plant in question is of a decidedly bad habit: this is its great drawback; this is its worst feature—one that I as an individual have never as yet seen fully overcome, although I have seen the two extremes of heat and cold resorted to, as well as intermediate treatment, in order to accomplish the end in view. Some say that bottom heat is necessary, while others declare that it is injurious. Some maintain that stove treatment is essential to success; and others say that the hot moist atmosphere of a stove frustrates all endeavours at the formation of a specimen, and that the greenhouse is the only place where stiff, sturdy, short-jointed growth can be secured. Among all these conflicting opinions, perhaps a middle course will prove to be the best.

Taking all things into consideration, the following is the method which I adopt. The plants being cut down after they have done flowering, the shoots are available for cuttings; these I cut into short lengths, each piece having two eyes and no more, cut horizontally just under the lowermost eye or bud, and in a sloping direction just above the topmost bud. This difference in the way of cutting the top and bottom prevents any possibility of mistake in putting in the cuttings; for once I saw a lot of cuttings put in, and one-half were wrong way up. This might very easily happen when both ends are cut alike. Another reason for cutting the top sloping is that the water is not so likely to lodge upon it as when cut straight across. After the cuttings are prepared as above, place

them on a shelf, or any other such place, for two or three days to dry, then they may be put in a pan or pot, well drained, and filled with peat and sand in equal proportions. The cuttings should be inserted about one-half their depth, and be plunged in a brisk bottom heat, and shaded from the sun. They will be rooted in about four or five weeks. They should then be potted off singly into small size pots, say three inches in diameter, and kept warm and moist until they have taken to the fresh soil. They are then gradually exposed to a more airy position, and exposed more fully to the sun, but still kept moderately warm, and syringed on fine afternoons. As soon as they have nicely filled their pots with roots (which they will very soon do), prepare for their final potting, and the first consideration will be soil. I have tried several mixtures, but have not found any more suitable than the following:—Two parts loam (the more fibre the better), one part peat, half a part of very rotten dung, and plenty of sand; an addition of half a part of brick rubbish, such as old mortar, &c., where it can be had, is, in my opinion, beneficial in keeping the whole open and porous. This being ready, the next part is the pots. What is the best size? I say eight inches; get as many of these as you may require, drain them well, for much depends on this, to keep the soil sweet and healthy. All being in readiness, fetch the plants to the potting bench, and turn them out one by one, and place them in one of the pots previously prepared for their reception, until five plants are thus situated, one in the middle, and four round the edge of the pot, placed so that the fresh compost shall cover the old ball about an inch deep, being careful that the soil is worked around and between the different plants to fill up every crevice. Proceed in this way until as many pots are done as you require. Then as to temperature, I avoid both extremes. I neither place them in a stove, strictly speaking, nor a greenhouse, but in a house that is intermediate between the two. A week or two in the stove just after re-potting is, however, beneficial, inasmuch as it causes them to start again into active growth, after being disturbed, but I would not permit them to remain in this position long after they had got fairly at work again.

I never plunge them in bottom heat after they are established in the three-inch pots, but merely stand them on a stone, where they remain the whole summer. A stick is put to each shoot, the centre one upright, and the outside ones leaning outwards a little; to these the shoots are fastened as they grow, but never stopped. In the autumn they are kept much dryer and more airy than in the summer, which causes the wood to ripen, and consequently flower, which they do most beautifully, in the winter months. The following spring they are cut down to one eye, but as there are several invisible buds round the base of each shoot, they will most likely push in several places; when this is accomplished, turn them out of the pots, remove a portion of the old soil, but don't break the ball,

then put them in pots a size larger than before, using the same kind of soil, and treat them precisely as in the previous season, and fine plants will be the result.

T. J., Manchester.

REVIEW.

AMPELOGRAPHIE FRANÇAISE. &c.; a Description of the Principal Vines, Methods of Culture and Wine-making employed in the best Vineyards in France. By VICTOR RENDU, Inspector-General of Agriculture. Published under the auspices of the Minister of Agriculture. Folio. Paris, 1854-56.

[We lately received from the French Minister of Agriculture, M. Monny de Mornay, a copy of this valuable work. The following review is from a gentleman conversant with the French language, and intimately acquainted with the cultivation of the vine.]

The superb work, the title of which is given above, affords ample proof of the interest cherished by the Government of France in the material prosperity of that country, and of the care and liberality with which its present ruler aims at fostering and increasing the internal resources of his great empire. Our allies have evidently men among them, who know what to do, and how to do it. Such a union as this volume exhibits, of statistical precision, scientific analysis, and pictorial illustration, has never, so far as we know, been seen in this country. Among scientific men there is a growing impression that Parliamentary Governments, however excellent in other respects, are not the best adapted for eliciting administrative talent in the arts and sciences. They are strongest in the *Laissez-faire*, or let-alone principle. In our own Legislature, for example, there is sometimes a readiness to pass such votes of money for public improvements as are fitted to make our continental neighbours stare; but certainly the results contained in the blue books, and other similar productions, look very *fade* alongside of the *Ampelographie Française*. It may be a little mortifying, but still we are bound to own that "they manage these things better in France."

The growth of wines in France is a matter of vast importance, and is worthy of all the attention paid to it. The vineyards cover an area of nearly five millions of acres; they produce annually above 800 million gallons of wine, and about 24 million gallons of brandy, of an average value, together, of nearly 20 millions sterling. Besides, a very large quantity of grapes are consumed as food; in addition to what are eaten in the provinces, Fontainebleau sends to Paris grapes of the Chasselas blanc, valued at one million of francs, and besides other sorts, Montauban contributes about one-fifth of the same quantity, of its cognate Chasselas. Of the 86 departments of France, only 11—those, namely, along the shores of the English Channel, those in the promontory of Brittany, and Creuse in the centre, do not produce wine; of the remainder, 27 supply common wines, while the other 48 furnish wines of finer quality, and of more or less repute. It is well known that some of the French wines are the finest in the world. In the southern departments formed out of the old provinces of Rousillon and Languedoc, the vine covers a very large proportion of the cultivated lands, and the area occupied by it is very largely increasing.

A subject of so much importance demands attention, and accordingly numerous works on vines and wines have been published in France; of these, the memoirs and treatises by Jullien, Chaptal, Odart, and De Gasparin in his "Cours d'Agriculture," are the most noted. Comtes Odart and De Gasparin inform us that various attempts were made to establish a correct synonymy of vines; that no fewer than 1300 supposed varieties were assembled in the nursery of the Luxembourg; but that owing to the complexity of the sub-

ject, and the tendency of vines to sport on a change of soil, nothing effectual was ever accomplished. Reunions of vine-growers, under the name of *Congrès viticoles*, were held at Bordeaux, Dijon, &c., and probably resulted only in much talk, as is usual where French "most do congregate." Odart's *Ampelographie Universelle* was a well meant but not very successful attempt to supply this deficiency. At length the French Government took the wisest step they could in the circumstances; they resolved to send qualified persons to examine the vineyards on the spot, and to make coloured drawings of the vines of historical notoriety, or economical importance. The chief part in this mission was confided to M. Rendu, Inspector-General of Agriculture; and with him were associated M. Grobon, an able fruit-painter, and M. Peplowski, an experienced agricultural chemist. After five years of labour and enquiries, the result has been the admirable work now before us. We very much wish that our readers could inspect it with their own eyes, for any attempt to characterise it in words must seem to savour of exaggeration.

The work is in folio, and in all its parts resembles what the French call a *Livre de luxe*, while it is really one of the greatest utility. The first part is composed of a map of the departments of France, coloured so as to represent the growth of the different wines, and of 68 coloured plates, two exhibiting the various parts of the flower, fruit and plant of the vine, about 60 of the most celebrated wine-yielding grapes, and the remainder of a few of the best varieties for the table. The plates are accompanied with detailed verbal descriptions of the different sorts. It is hardly possible to speak too highly of this department of the work. M. Grobon has portrayed the shoot, leaves, and branch of each of the grapes in the most vivid, natural, and graceful manner. First lithographed with a slight shading, they have been coloured with the hand, and many of them seem to stand out from the paper in something like stereoscopic relief. It is most interesting to contemplate "the counterfeits presentments" of the Muscats of the south, the Furmint which yields the Tokay of Hungary, the Roussanne and Marsanne the parents of the Hermitage, the Pineau of Burgundy, the Folleblanche the mother of brandy, and the Cabernets and the Merlot the staples of the Claret vineyards. We doubt not that these beautiful coloured engravings, of which the subjects have evidently been selected with the greatest care, will long remain the standard of correct nomenclature in France.

The second part of the work, consisting of 160 folio pages, unfolds with great minuteness the statistics of the vineyards, and these not merely in dry numerical tables, but in full descriptions of the different localities, the different modes of culture, the preparation of the wines, and in short the total *reueignemens*, as a Frenchman would phrase it, of the whole enquiry. Our readers will readily comprehend that this section is not quite so attractive in appearance as that which is occupied with the pictorial illustrations; but it seems quite equal in point of practical utility. M. Rendu's observations are models of statistical enquiry which it would be well for our matter-of-fact men to imitate; though probably it would be impossible to approach their accuracy and fulness without the prestige of official authority. The chemical analyses of the soils of the principal vineyards are most pains-taking and apparently exact. Perhaps we might be inclined to desiderate a little fuller geological information, though that is not altogether overlooked. We were a little disappointed that M. Rendu, when describing the vineyards of Burgundy, did not allude to that relation of volcanic soils to first-class wines, which has been affirmed by various authors—and Dr Henderson among the number—but perhaps it is only a fancy after all. We may add that only 300 copies of the work were completed in its present form, of which 100 are for sale at the price of 360 francs per copy. In this form, it should be in all our public, and specially in our agricultural and horticultural libraries. There is an octavo edition without the plates, and the letterpress immediately referring to them, which may be had at a moderate price.

M. Rendu divides France into 6 wine regions, with Corsica as a seventh. These he treats in succession, beginning at the eastern extremity of the

Pyrenees, ascending the Rhone to the north-east, and passing through the centre to the Bordelais, which forms his sixth division. It is impossible to enter into a detailed account of these, and we must content ourselves with mentioning what was most novel to us, in the hope that it will also prove interesting to our readers.

The first division includes the ancient provinces of Roussillon, Languedoc, and Provence, the land of the Troubadours, the land of "dance, Provençal song, and sunburnt mirth." It appears that they had rich and potent wines to inspire their gaieties, for the vinous products of that region are partly the sweetest, and partly the strongest in France. In that sunny climate, too, the vines are permitted to grow to a greater height, and are more trained into festoons than they are elsewhere north of the Alps and the Pyrenees. The red wines are strong and alcoholic, but being chiefly consumed at home, or exported to America, are little known in this country. The white or Muscadine wines, the *Vins Muscats* of the French—grown at Rivesaltes, Frontignan, Lunel, &c., have a world-wide celebrity. The inferior growths are mostly distilled into brandy, and still more into an article peculiar to this quarter, called *Trois Six*, or 3-6, much employed in the "vinification"—that is, the increase of the alcoholic strength of wines in that and other parts of the country. There are various sorts of it, but of the principal kind called *Trois-Six de bon gout*, about 11 million of gallons are manufactured annually. This is not to be confounded with the brandy of Montpellier, which is veritable *eau de vie*. An inferior quality of 3-6 is made from the *marc de raisin*, that is the residuum of seeds, husks, and stems, which remains in the wine-press after the must is run off. In the Canton of Lunel, the dreg of this distillation is used for the fattening of cattle, and to furnish it a small charge is worked off every morning.

Passing the region of the south-east, though it produces the celebrated vine-tages of Saint-Péray, Hermitage, and Cote-rotie, we may proceed to the eastern division—the natal soil of the wines of Burgundy and Champagne. The produce of the former of these districts was famous even in the times of the Romans, and it maintained its celebrity in the middle ages. The Dukes of Burgundy proudly styled themselves "the Lords of the best wines in Christendom." To preserve this distinction, and to encourage the culture of the Pineau, the famous little grape which yields the "vins nobles," one of the Dukes, in the 14th century, published a decree, denouncing a grape then and still called Gamai, which he declared to be "*une plante tres mauvoise et deloyale*"—very bad and disloyal—which, nevertheless, has kept its ground, and, in one of its better varieties, is the fruitful parent of the second class wines in this region. The Pineau is still that which yields the first class wines, but its produce is comparatively small, and it is apt to suffer from spring frosts. In this district, the "vignerons" have often to choose between "vins nobles," with a small yield, and wine of a moderate quality, with increased quantity. In most situations the latter alternative is the better commercial speculation, and the consequence is that the finest Burgundy wines are comparatively rare even in France, and not bearing transport well are seldom seen in this country. We must leave the Champagne wines till some other occasion.

The Region of the West includes four departments, two of which produce respectable wines; and in the other two, the Charente and the Charente Inferieure, the wines are converted into brandy, to the extent of nine to eleven million of gallons annually. It passes generally under the name of *Eau de vie de Cognac*; but it appears that only a moderate quantity is derived from that celebrated locality. The finest sort—the finest, indeed, in the world—is produced from a district called Champagne, situated in the lower Charente, which name, however, from its liability to be confounded with the birthplace of the noted wines in quite a different quarter of France, has not come into vogue in the liquor selling and consuming world. It appears that there are nearly as many qualities of brandy as there are of wines. M. Rendu states that the best sorts are never tasted by foreigners, except in France. He also

hints that the manufacture of this article is not improving, that adulteration is becoming a common practice, and that the ancient loyalty of the old French manufacturers is disappearing so fast, that the discredit if not the ruin of a fine branch of industry will be almost the infallible result. We fear that some of our Scottish distillers are aiding in forwarding this consummation. At another time we shall probably return to this interesting subject.—*North British Agriculturist.*

THE PRAIRIES.

Unrol the map of the world, and look upon the great northern continent of America. Away to the wild west, let your eyes wander towards the setting sun. Rest them where golden rivers rise among peaks that carry the eternal snow. You are looking upon a land whose features are unfurrowed by human hands, still bearing the marks of the Almighty mould, as on the morning of the creation; a-region where every object wears the impress of God's image, and where his spirit lives in the silent grandeur of its mountains, and speaks in the roar of its rivers. Let the eye of your mind follow me through scenes of wild beauty, of savage sublimity, and of the unbroken romance of nature. Standing on an open plain, I turn my face toward north, south, east and west, and on all sides behold the blue circle of the heavens girdling around. Neither rock nor tree breaks the ring of the horizon. What covers the broad expanse between? Wood? Water? Grass? No: flowers; as far as the eye can range, only flowers. Yonder is golden yellow, where the *Helianthus* turns her dial-like face to the sun; yonder is scarlet where the *Malva* erects its red banner. Here is a parterre of the purple *Monarda*, there the *Euphorbia* sheds its silver leaf. Yonder the orange predominates in the showy flowers of the *Asclepias*; and beyond, the eye roams over the pink blossoms of the *Cleome*. The breeze stirs them: millions of corollas are waving their gaudy standards; and the tall stalks of the *Helianthus* bend and rise in long undulations like billows on a golden sea. They are at rest again:—the air is filled with odours; myriads of insects flap their gay wings; the bee-birds skirr around, glancing like stray sunbeams; or on poised wings drink from the nectared cups; and the wild bee with laden limbs clings among the honeyed pistils, or leaves for his distant hive with a song of joy. Who planted these flowers? Who has woven their pictured embroidery? Nature. The hunter calls it "*a weed prairie.*" It is mis-named. It is the flower garden of God!

The scene is changed. I am in a plain as before, with an unbroken horizon circling around me. There is not a flower in sight; nothing but one vast expanse of living verdure. From north to south, from east to west, stretches the *Prairie meadow*, green as an emerald, and smooth as the surface of a sleeping lake. The wind is upon its bosom, sweeping the silken blades; they move and the verdure is dappled into lighter and darker shades, as the shadows of summer clouds flitting across the sun. The eye wanders without hindrance; perhaps it encounters the dark hirsute forms of the buffalo, or traces the tiny outlines of the antelope; perchance it follows the far-wild gallop of the snow-white steed. This is "*the grass prairie,*" the boundless pasture of the bison.

Again the scene changes. The earth is no longer level, but treeless and verdant as ever, and is covered with a soft turf of brilliant greenness. Its surface exhibits a succession of parallel undulations, here and there swelling into smooth round hills, reminding one of the ocean after some great storm, when the crisped foam has died upon the waves, and the big swell comes bowling in. They look as though they had once been waves, which, by an Omnipotent mandate, had been transformed to earth, and suddenly stood still. Such is "*the rolling prairie.*"

Once more the scene is changed. There are green swards and bright flowers; but the view is broken by groves and clumps of copsewood. The

frondage is varied; its tints are vivid, and its outlines are soft and graceful. New landscapes, views park-like and picturesque unfold themselves continually. Gangs of buffalo, herds of antelope, droves of wild horses mottle the far vistas; turkeys run into the copses; and pheasants whirr up from the path. Where are the owners of these lands, these flocks, and fowls? One looks forward, expecting to see the houses, the palaces, the turrets of tall mansions which should be embowered in these lordly parks. But no: for hundreds of miles around no chimney sends forth its smoke, no window gleams in the sun, no hospitable gate expands in welcome. These are the mottes, the islands in the prairie sea.—*Captain Mayne Reid.*

OLD VARIETIES OF FRUIT WEARING OUT.

Much discussion has arisen of late on the deterioration of certain favourite fruits, or what is more generally understood as the *wearing out* of certain varieties which at one time stood in the foremost rank. That such a "wearing out" has been and is going on I believe there are not ten practical men in the kingdom will deny, but there are some points connected with it which render it difficult to reconcile with other events of a like nature. I therefore make no apology for noticing a few of them.

Beginning with STRAWBERRIES, it is somewhat odd that *Keens' Seedling*, a variety that has done thirty years or more hard service, should be as healthy and vigorous as ever, and is by far the most popular variety we have, while *Wilmot's Superb* and some others which followed it are now nowhere to be found. It is, perhaps, wrong to infer that these were worn out; but if we come to a much later variety, *Myat's British Queen*, we see unmistakable tokens of an exhausted constitution, for there are many situations it cannot be made to grow in even by all the careful treatment that can be devised, whereas a few years ago it answered moderately, though never so vigorous, certainly, as *Keens' Seedling* and some others. Maybe some will be saying that it came first into existence with a debilitated constitution, and consequently cannot survive long. If that be admitted the key of the whole argument is surrendered, for it is only a matter of time whether a variety lasts five years or fifty years, or whether one lasts the former period and another the latter.

Human and animal life is governed by like laws, and doubtless a time will come when *Keens' Seedling* will cease to be as healthy, prolific, and useful as it is now; but we hope to see its place taken by others of equal if not superior merit. Other examples of Strawberries might be given, but we pass on.

GOOSEBERRIES.—There being no lack of good varieties of this fruit, few care what becomes of the old ones; but one old favourite kind is certainly consumptive, the old *Warrington*, or what, in the north of England, is called the *Ashton Red*. The limited growth and unhealthy appearance of this tree convey the lesson that it has got one foot in the grave. Another favourite old sort, the *Green Gage*, is still further advanced in disease, and though the *Warrington* is still grown, because it has established a name which we are unwilling to part with, there are few extensive plantations of it now, and the *Green Gage* Gooseberry is all but extinct amongst those who grow for the market. Perhaps the most common one grown about here (*Staplehurst*) is a rough yellow one, early, but of no other merit than being a heavy bearer, and the buds on its shoots are less tempting to small birds than those of other kinds. Large Reds, Greens, and Whites are also grown, but few *Warringtons*.

Passing over Currants and Raspberries, the varieties of which are too few and less noticed to afford examples either of endurance or otherwise, we come to the larger fruits, which furnish by far the most decisive proofs of "wearing out."

PEARS.—Whoever has seen two or three good crops in succession of *Gansell's Bergamot*, the fruit being also good? or where is the *Crassanne* grown as perfect as it was thirty years ago? Probably thirty years hence the *Jargonelle* will be a fruit known only to history, for healthy trees of this variety are few and far between. Many other useful old varieties are fast approaching the same end. *Green Chissell*, *Autumn Bergamot*, *St Germain*, *Crawford*, and *Chaumontelle* are rarely met with in the healthy condition they were some years ago; and assuredly we cannot attribute their decay to any other source than the debility of the tree, the soil, treatment, and other things being the same as before.

APPLES.—This is the fruit so often referred to for examples, and numerous old kinds are significantly pointed to as affording decisive proofs of decay. The old *Golden Pippin*, *Golden Reinette*, several of the *Pearmains* and *Codlins*, and a host of others are no longer to be met with in the healthy, profitable, bearing condition they once were, while some are discarded entirely. The *Ribston Pippin* and *Golden Knob* are fast following to the same end, and would, perhaps, have been extinct before, only they being particular favourites have been propagated wherever there was a chance of their succeeding; still the supply of them is daily diminishing, and in a few years *Ribstons* will cease to exist in very many places. To account for this on any other score than that of "wearing out" I confess to being unable, and to suggest a remedy or preventive would be only recommending what had been done over and over again with successive disappointments.

As it is needless to multiply examples it is only necessary to take a glance at the condition under which fruit trees are grown. Apples, for instance, are the offspring of Crabs, the best kinds being the produce of repeated sowings of the seeds of improved varieties; but be it remarked that this improvement cannot be effected without in some way sacrificing the constitution of the plant, and, like the *breeding in and in* of animals, a delicate race is the result, differing more or less in degree as the case may be, yet still bearing tokens of that effeminacy resulting from the artificial position a grafted tree is in. This would be still more so were it not for the vigorous nourishment it receives from the hardy stock it is worked on. Still this is not sufficient to maintain in good health scions taken from aged or long-propagated varieties, and each succeeding generation getting weaker, an abandonment of the whole takes place, as is the case in the old Apples no longer cultivated. Some varieties threaten to be very short-lived; the *Hawthornden Apple*, for instance, is seldom seen in good condition, and is often a complete mass of canker.

Now, the obvious lesson taught by the above is to cultivate only the varieties known to be healthy and good, and, where they lack flavour or some of the other good points of old favourite sorts, let well-directed skill be employed in the raising of other varieties which may equal if not excel any hitherto known. We have had enough of old kinds; and, though it is unkind and ungrateful to discard old friends, we cannot well retain all who are a burden to us; and, be it remembered, old Apples and Pears were often the compeers of our ancestors, and are consequently excusable if they fall short in the utilitarian principle which governs the dealings of the present day. If there be any one who disputes the liability of all cultivated varieties of fruits, perpetuated as they are by budding or grafting, to fall into irremediable decay, let him point out instances where the old kinds have been retained in health and utility when the trees have arrived at maturity. Until then I, for one, must class all the improved varieties of fruits with fallen mortality, and whether the utmost that each specimen may attain be three hundred years or three score and ten, the time for each is sure to come, and usually in both cases, preceded by disease.—J. ROBSON, in the *Cottage Gardener*.

[The cause is evidently progressing. In our last number Mr Errington declared his belief in the "wearing out" of certain races of Fruits. In the

foregoing paper our readers will see what Mr Robson, one of the principal writers in the *Cottage Gardener*, says on the subject. These are practical men, and we do not like their testimony the less, that they do not commit themselves to the assertion of theories. Probably, if gardeners would put away the fear of budge Doctors from before their eyes, if they would employ their own powers of observation, and speak out boldly what they see, we should speedily have all the evidence needed in the question of degeneration.

Mr Robson very properly directs our attention to the former and present condition of certain sorts of Strawberry. This is a plant which has not yet yielded its full quota of evidence. In our first paper on degeneration, we were obliged to omit it for want of room; and now we are almost afraid to say anything about it, for we have, forsooth, been pronounced deficient in practical knowledge by a great speculative authority. With much meekness, then, and bated breath, we venture to say a few words about Strawberries. The varieties of Hautboy Strawberries, we have observed, wear out very rapidly on certain soils. The different sorts of the Wood and Alpine Strawberries also have very little permanence. We learn from the *Pomone Française* of Comte Morel de Vindé, that the latter are commonly treated in France as annual plants, being sown on an early hotbed every spring, and planted out in the open ground where they fruit abundantly in autumn. We lately tried the experiment, but failed from want of a sufficiently genial climate. Respecting the Alpine Strawberry, the *Bon Jardinier*, an unexceptionable witness, says that it is "subject to degenerate into round fruit, but may be regenerated by sowing, which is the best manner of renewing it." It is now 40 years since we first made the acquaintance of the Roseberry Strawberry. We then carried it in our own hands to one of the first gardens in Scotland, where it was for a time extensively cultivated, and bore large crops. At that period it was something of a *perpetual*, in the sense in which certain Roses are called perpetuals,—that is, it had a second season of flowering, and bore fruit late in autumn. Of late years it has seemed to us much fallen off; but we do not speak positively, because, as aforesaid, we are not supposed to be practical, and more particularly because we are not now living in a district propitious to Strawberries. We would suggest that some of our readers more favourably situated, would tell us something about the Roseberry. We should also like to know what has become of the Bostock, Hudson's Bay Pine, Carolina Pine, and various other sorts mentioned in our old friend Barnet's excellent paper on Strawberries, in the Transactions of the London Horticultural Society. With respect to many of the recent fancy varieties, we agree with Mr Robson in thinking that they are not likely to remain long in good condition. They have manifestly too much of a peach-house or vinery constitution to be fitted to stand the wear and tear of the average climate of Great Britain.—*J. S.*

SUMMER TREATMENT OF GREENHOUSE PLANTS.

Most greenhouse plants begin their new growth when they have done blooming, and according to the manner in which this new growth is encouraged or checked, so will they be better or worse for blooming the next year

Many people turn out their greenhouse plants as soon as they have lost their beauty, and then they must take the chance of all weathers, at a period when they are most of all liable to suffer, that is, while the young growth is pushing. A cutting east wind will then crumple the foliage, and spoil the appearance for a year. As soon as a plant has done flowering, and before any growth is made, it should be pruned into form. It is the only stage at which we can properly regulate the growth, by cutting in long awkward shoots, removing any branches that are not wanted, and so managing it that the new growth will fill up the surface and form it into a handsome specimen. In a general way, we can afford to cut all the shoots a good way back, some as far back as to leave only two or three eyes. *Camellia Japonica* is a plant that wants great attention, or it will grow ugly. The shoots at the ends of the branches start before the bloom has opened, the flower is the smaller and weaker for it, the new shoot takes up the growth and merely lengthens the branch that is already long enough, and it is the same with the other branches, they all lengthen, no side and lower shoots come, the plant grows tall, without getting more bushy, and in two seasons is spoiled. When the spike next the bloom-bud begins to push, remove it; never leave the end shoot on unless you want to lengthen the branch; by picking them off the whole strength of the plant is thrown into side shoots, branches, and flowers. But this is not all that is to be done. Shorten every branch that is too long, cut out any weak wood that clogs up and confuses the centre, make the plant of a good form, by cutting back whatever is ugly, and if the pot is full of roots, shift the plant into a larger one; but as *Camellias* are now set for bloom and have done all their growth, set them in the shade. See that they do not want for water, and let them rest and harden. With regard to other hard-wooded plants that bloom next year upon the wood they make in this summer, the best treatment is to be as nearly as possible assimilated to that of the *Camellia*, that is to say, when the beauty of the bloom is over, prune them into such form as you wish, before they put out any of their new growth, because it is then that the plant furnishes itself. Many do this and set them out of doors in the shade, but there are some plants that, like the *Camellia*, are out of bloom before it is safe to turn them out of doors; these must make their new wood in the house, and be well grown and perfected before they are turned out. The perfection of a turn out is, however, under a canvas awning, like a Tulip frame, because, when closed up, the sharp winds take no effect on them. With a convenience of this kind most plants might be pruned and turned into the canvas house, as they decline flowering, but they will require some attention. They must have protection from the wind, when north or east, and from the sun during the heat of the day. They must have all the air they can get, and in fine genial weather, except the few hours of mid-day sun, they may be open altogether. They may also have warm showers, but they must be shut up in their canvas abode whenever the wind is high, and also when in the wrong quarter. When the plants have made their growth they may be more exposed, still they must not have the hot sun. But after all is said and done, the pruning is by far the most important operation, because, this done well, your plants will be handsome, however large they grow; neglect this and they will be barelegged, nothing but naked wood at the bottom, and totally unfit to show singly, even on your own shelves. What is the consequence? When you arrange your greenhouse for the winter, you crowd them, to hide their naked stems, and make bad worse. They may make a pretty bank of flowers, because you see nothing but their tops. Whereas, prune them every year before they make their new wood, keep them well down, for the top eye or bud left is sure to grow most vigorously, and for this you must make allowance when cutting back or pruning. As, therefore, you must, properly speaking, begin in the spring, prune everything as it goes out of flower. *Hoveas*, *Acacias*, *Camellias*, *Correas*, *Chorozemas*, *Cytissus*, *Cestrum*, *Epacris*, *Nerium*, *Pimelia*, and many others, are usually turned out as soon as they have done flowering, and allowed to grow as they may; hence, after the second or third year, the plants

instead of being handsome, are very ugly. Whether they are put in a canvas house, or merely placed in a shady border, matters but little, compared with the importance of first cutting them into shape. The *Camellia* ought not to be turned out until it has made its new growth complete, and set its bloom, because it has generally done blooming by the end of March, and a check, just as it makes new wood, stops its setting well for flower, and it is good for nothing unless full of buds. This can always be ensured if well attended to while growing, and liberally watered. An awning, to merely keep the sun off greenhouse plants, does good, because then they could be placed in an open space, and have plenty of light and air, and be more free from vermin than they could be under natural shade, whether it be from walls and trees—one more point with regard to the summer treatment of greenhouse plants, because the common practice is to crowd them into as little room as possible, and they get neither light nor air in sufficient quantity. They must have abundance of both to do any good; they must be often examined to see if they want water or shifting, though it is desirable to avoid that if possible, until they are taken back to the greenhouse.—TIFFANY, in *Midland Florist*.

A PLEA FOR SUMMER ROSES.

With the return of Rose tide, I am desirous to offer a few words respecting the Queen of Flowers. And although my notions may and will be deemed antiquated by many, I feel myself in no way constrained to maintain silence on that account. Fashion is all very well to a certain extent, but I hold it *not* well to make inordinate sacrifices at her shrine. A few quiet Midsummer evenings among my Roses have served to confirm an impression which has long been stealing upon me—that in devoting ourselves with so much ardour to the cultivation of the modern Autumnal Roses, we have suffered ourselves to become a little less than just to the tribe of the old Summer-flowering varieties. When I say *we*, I allude to Rose growers in general. Individually—although I have endeavoured to keep pace with the times, by purchasing most of the good (and how many of the worthless?) so-called Perpetuals, I have never had the heart to discard one of my really deserving old Summer favourites. I have no wish to depreciate the former, as I am fully alive to the beauties of such sorts as Louise Peyronny, Jules Margottin, Prince Léon, Robin Hood, William Griffiths, and a host of others too numerous to mention. But I find that where the Autumnal Roses yield me one flower the others furnish at least a dozen; and coming—as they do—all together, the effect they produce is truly magnificent. I am writing in full view of a standard of H. C. Magna Rosea, six feet high, with pendulous branches, seven or eight feet in diameter, made doubly pendulous by the weight of hundreds of its large and delicately tinted Rose coloured blossoms. Near it stands a specimen of H. C. Fulgens, of the like proportions, whose brilliant flowers are positively innumerable. H. C. Beauty of Billiard—a later blooming sort—still more vivid in colour, gives promise of equal abundance. I have appropriated a border, some 180 feet in length, to the growth of Summer Roses. These are arranged in three rows;—the hindmost, consisting of the most vigorous-growing sorts, are standards four feet in height; those comprising the middle row are less diffuse in habit, and are worked on eighteen inch stems, while those in the front row consist of compact-growing varieties on six inch stems or thereabout. The front and middle rows are (almost, exclusively) on the Manettii stock, and the back row on the Dog Rose, but even these are being gradually replaced by the Manettii, which have been cultivated for the express purpose. The main object in view is the production of large masses of bloom; and in favourable seasons the effect is most striking. Let me enumerate a few of what I consider the gems of the collection; and as the names even of some of them may well be strangers to many a modern grower, perhaps I may be pardoned if I add a

word respecting the colour and habit of some among the number. I give the post of honour to Coupe d' Hébé and Paul Ricaut, *Hybrid Bourbons*, two Roses which have never been surpassed. Can two other perfectly hardy Roses be found to equal them? Look again (keeping to the same family) at Charles Duval and Paul Perras, two rose coloured sorts as distinct in shade as in character, and of which it would be difficult to say which advances the greatest claim on our admiration! Glorieux and La Dauphine—delicate blush;—Le Capitaine Sisolet, Le Vesuve and Miss Chauncey—rose;—Tippoo Saib—salmon pink; Comte Boubert—pale crimson; and Henri Barbet—deep crimson, occasionally intensely vivid—are all good sterling varieties, which, if never destined to become again fashionable, will assuredly never be deprived of their inherent loveliness.

“A thing of beauty is a joy for ever.”

In the *Hybrid China* section, Blairii No. 2, is conspicuous as a fine Rose, delicate in colour, and of vigorous growth, although a thought too tender to bear our severest winters unscathed. Brennus and Chenedole are large vivid crimson or carmine varieties and form magnificent standards—General Jacqueminot—crimson purple, of exquisite shape, is, in my humble opinion, immeasurably superior to its Autumnal namesake, although the latter ranks very high in my estimation—Triomphe de Bayeaux is a pure white rose, and a strong grower; Juno, Belle Marie, Marie de Champlouis, Charles Fouquier and Gloire de Couline—varying in their tints from rosy pink to rosy carmine—are, one and all, worthy of distinguished places in any garden. Decandolle—brilliant crimson—although less full than many of its congeners, is a most attractive variety, and forms a fine pendulous head; Madame Rameau, very dark—an old sort but little known at this day, comes occasionally in such fine character that it is second to none; Comtesse de Lacpede—delicate blush—is a Rose of moderate growth, but exquisite in form. A plant of Leopold de Bauffremont, *Hybrid Noisette*, is this year blooming in extraordinary perfection. Mr Rivers describes it as—“delicate rose, a beautifully shaped and most vigorous growing variety.” The specimen of which I speak is literally one mass of flowers—so closely studded together that the foliage is completely obscured. Take again the *Gallie* or *Garden Roses*, as they were formerly called. Look at Boula de Nantueil, D'Aguesseau, Gloire de Colmar, Grandissima, Kean, Lat ur de Auvergne, Ohl, and Triomphe de Jaussens! Can anything be more brilliant than the varying but glowing tints of these, or anything more pleasing than the soft hues of their less intensely coloured relations—such as Cynthie, William Tell, Schonbrun and a legion of others? Show me the pale faces that can be compared with Aspasie, Blanche fleur, Comte Plater, Comtesse de Segur, Princess Clementine—“one of our finest and most perfect white roses”—and Rose Devigne in the *Hybrid Provence* class, or perfection of shape more thoroughly exemplified than in Adrienne de Cardoville, a member of the same family? Who will refuse to admit Felicite, La Seduisante, Madame Audot, or even the venerable Queen of Denmark as fitting representatives of the *Alba* or *Belgic* Rose; or to recognise in *Damask* Madame Zutman one of the best varieties to be found in any of the numerous divisions or sub-divisions which sorely perplex the novice, and afford but little solid information to the initiated?

Of *Provence* Roses I scarcely need speak. I presume few would have the hardihood to banish the old Cabbage Rose; and even the sternest denouncers of the summer kinds are compelled to make a reservation in favour of the *Moss* tribe.

I ask you not, good readers, to take my bare word in this matter; but I do ask you to examine and judge for yourselves—now—at the very height of the Rose season, before the opportunity of instituting a comparison shall have passed away. Tell me not that the “Rose of June” is fleeting and evanescent! “All things bright must fade.” And if there be any soundness in such an argument, you might as well object to Youth, or Beauty, nay Life

itself, since neither can establish the shadow of a claim to the proud title, falsely bestowed upon a certain section of Roses—that of perpetual.

These hasty observations have been prompted by the increasing coolness manifested towards my "old friends." Pending the famous "Controversy," which lately agitated the floral community, summer Roses were as completely ignored as though they had never existed. The last Catalogue issued by the father of English Rose-growers—Mr Rivers of Sawbridgeworth—commences with the following words, which I could not read without a feeling of regret.

"SUMMER ROSES.—The numerous varieties of this class, once nominally more than 2000, have now become of secondary interest, except for showing as single blooms for prizes, owing to the introduction of so many beautiful Autumnal Roses, more particularly the varieties of Hybrid Perpetuals, which now comprise all that is most perfect and beautiful in form and colour. A summer Rose tree, whether bush or standard, when its flowers are passed away, is a most uninteresting object; in a few years it is most probable that, with the exception of Moss Roses, Summer Roses will be spoken of as things that were."

Notwithstanding the dictum of so high an authority, I cannot consent either to place them under ban, or to consign them to oblivion. They were the marvel of my childhood and the admiration of my youth: in maturer age they lent a charm to many a rugged pathway on the journey of life: in declining years they have been my familiar companions; and I shall continue to cherish them until my dying day.—AN OLD STANDARD, in *Gossip for the Garden*.

PLANTS AND ANIMALS COMPARED.

Animal and vegetable existences, in some respects, resemble each other, and in others they differ. The first and most important resemblance between plants and animals is, in their possessing what has been called a living principle; this constitutes the chief difference between organized and unorganized existences, and it is only while it exists in the former that these exhibit the other qualities, by which they are distinguished from brute matter. An animal breathes, moves, and feels, and performs certain actions for a time; this is animal life. It then ceases to show any of these properties; it lies motionless and insensible, it undergoes rapid decomposition, and is resolved into its original elements. This is death. And something analogous to this takes place in plants. The living principle appears, indeed, under a different and less perfect modification, but still it is there. Although vegetable existences have no voluntary motion, yet possess certain vital functions, they select and secrete their food, they grow, they expand and flourish. This is vegetable life. After a time their functions cease, they droop as the Pansy on a hot summer day, they decay, and are decomposed. Their life is fled. In both animals and vegetables, the principle of life is endowed with a power of repairing injuries to a certain extent, so as to reproduce decayed or destroyed parts. In both, also, there exists a power of reproducing the species; nor is the resemblance less remarkable in regard to a property, the existence of which, in vegetables, till lately was but little known—that of the circulation of a fluid through every part of the body. A fact that the blood circulated through the veins of animals never escaped observation; the principle on which this remarkable function depended, was but very lately discovered, but it does not seem to have been suspected, till within these few years, that there was an analogous circulation through vegetable substances. That sap existed in plants, indeed, was a familiar fact, and that in greater profusion at one season than another, and that there is a regular and periodical circulation of sap from the root through the stem of the plant to the branches, buds, and leaves, and back again through the bark to the root. Wonderful, indeed, that this circulation is as essentially necessary to the life and growth of vege-

tables, as the circulation of the blood is to the life and growth of animals. In the manner of the propagating the species, too, there are some curious resemblances between the vegetable and animal creation. The whole class of plants, like animals, with few exceptions, is divided into male and female, and the majority of plants, in their flowers, possess the organs of both male and female, for the propagation of their species.

Plants, as well as animals, select and secrete their food, but there is a marked difference, both in the nature of the food and in the process by which this nourishment is conveyed and appropriated. The vegetable, adhering to the soil, draws food from thence, through the medium of roots, by mechanical action, without volition, without feeling, and without locomotion, and that food is inorganic matter. The animal, on the contrary, seeks for its food by a voluntary action, receives it into a system by a mouth, digests it in a stomach, and rejects crudities by an intestinal canal; its food is organised matter, either animal or vegetable.

The chilly nature of the season is not the only cause of the changes in the vegetable kingdom, which begin in autumn and are consummated in winter. The disappearance of flowers and fruits, the fall of the leaf, and the general sterility which prevails, are evidently the indications of a cycle belonging to the constitution of this department of nature, which corresponds with the cycle of the year, and affords, by its existence, a new proof of wise adaptation. In the extremes of climate, taken on the average, we have, as it were, permanent summer on the one hand, and permanent winter on the other, but in the temperate regions we have a regular alternation and modified heat and cold, which requires a different constitution of the vegetable creation, and that constitution has been bestowed. We here find the gradual development of seeds, and shooting forth of buds and leaves in spring; the vigour and prime of vegetation in summer, its maturity and commencing decay in autumn, and its temporary death in winter.

The stimulants of heat and cold exercise a considerable influence in promoting or retarding the periodical changes in the vegetable world, there can be no doubt, and this is just one of those wise contrivances which indicates design, as, without the modifying power, a slight variation in the temperature of the season, such as frequently takes place in all countries, and especially in a changeable climate like ours, might be productive of fatal effects; but the influence of heat and cold does not extend beyond a certain range, and is undoubtedly controlled by another principle which may be called the natural constitution of plants. The functions of plants have a periodical character entirely independent of heat and cold. Such stimulants could not produce the effects which annually take place, were not the plants formed, by the Author of Nature, to run their annual cycle. Now, let it be observed, that the year might, by possibility, be of any length; instead of extending to twelve months, it might be completed in six, and all the seasons might be comprised in that period, or its revolution might be lengthened to double, or fourfold its present period. In either case, the adjustment which now takes place between the seasons and the constitution of plants, would be entirely destroyed, and an utter derangement of the vegetable world would take place. The processes of the rising of the sap, of the formation of the proper juices, of the unfolding of the leaves, the opening of the flowers, the fecundation of the fruit, the ripening of the seed, its proper deposition in order for the reproduction of a new plant—all these operations require a certain portion of time, which could not be compressed into less space than a year, or, at least, could not be abbreviated in any very great degree. And, on the other hand, if the winter were greatly longer than it now is, many seeds would not germinate at the return of spring. The beautiful variety of shades in our woods and groves, towards the close of autumn, which the most inattentive observer must have admired, arises from the preparation which nature is making for the winter state of our shrubs and trees. The functions of the productive season are ended, the forest trees having completed their annual growth, the fruit-bearing trees having yielded their stores, and the leaves, which per-

formed such an important part in these processes, being no longer useful, are to be dropped, that they may, by their mingling with their parent earth, supply the waste of vegetable matter, and repair its exhaustion from the efforts of the preceding year. The sap, which has arisen profusely in the beginning of the autumn, to aid nature in giving maturity to the fruits, and vigour to the young branches, and thus to crown the labours of the year—having performed this important office, has begun to flow downwards through the inner integuments of the bark, there completing its periodical circulation. The leaf and flower bud, distinct, to be developed in the ensuing spring, have been already formed, and are carefully shut up in their winter cerements. The leaf falls. The tree, exposed naked to the wintry blast, is rendered, by a powerful provision of the all-wise Creator, proof against the injurious effects of frost. It is in a state of hibernation, like many beasts and insects, for here, too, the analogy of nature is striking. It has fallen into its winter's sleep. The proofs of this state of torpitude are numerous; among these, the most familiar is, that of the capability of removal, without material injury, to another place; there is no size or age of a tree which would prevent it from enduring transplantation at this season, with perfect success or safety, provided, only, it could be effected without greatly injuring the root, or any of the delicate small white fibres, and it is only in winter that such an experiment can be performed with any chance of success. Why? Because the powers of nature are then suspended, the plant has ceased to draw nourishment from the earth, and its vital principle, though by no means extinguished, is in a state of temporary lethargy. Now, the importance of this state of plants in winter will be obvious, if we consider the condition of the soil and climate of temperate regions during that period. The genial warmth, which caused the juices to flow, is gone, the ground is frequently rendered, by frost, rigid, and almost impenetrable, and tempestuous weather would endanger the destruction even of well-rooted trees, did not the removal of the leaves leave a free passage to the wind through the branches, and the cold would blast the delicate fibres of the young shoots; all these dangers are either entirely provided against, or, at least, rendered by no means formidable, by the torpidity which invades the vegetable creation. The plant still lives, but its food is gone; its active operations would expose it to be the sport of the angry elements, and, therefore, it has retired within itself, like the coiled hedgehog, to sleep out the ungenial season, and to prepare, with new vigour, for the exercise of its renovated powers in the coming spring. In plants, there is a living principle, which, of itself, resists, to a considerable extent, the effects of cold. But the Author of Nature does not rest the security of vegetable production on this principle; on the contrary, the safety of the bud on which the future existence of the plant so materially depends, is provided for by its careful envelopment in plies of scales, or, within a downy substance, besides being often united together by a coat of resinous matter; the intention of this kind of protection is distinctly indicated by the fact that it occurs only in Northern countries, the buds of trees, in milder regions, being destitute of the scaly coverings. In tropical regions, the leaf or flower not requiring any such means of safety, start into existence at once, without the intervention of buds—another proof of the designing hand of Nature in this provision. Of those plants that survive the winter, many die down to the root, and thus, like numerous animals, burrow, as it were, under ground, where, in virtue of their combined torpidity, and vital energy, they remain secure from the attacks of frost, even when it penetrates to their retreats. Here, some of them are secretly preparing mysterious internal processes for the coming spring, while others appear to lie entirely dormant till more genial weather awakes them from their deep sleep.

Again, other classes of herbaceous plants continue to brave the rigours of the winter, covered with a cold, but a bright mantle of snow; of these species which survive the winter, some are biennial, and others perennial, and, with respect to the former species, though their life may be prolonged, by trans-

planting them, and thus retarding the period of their flowering and bearing seed, yet no artificial means can prevent their decay, after they have provided for the future propagation of their species, by exercising this important function.

"He marks the bounds which winter may not pass,
And blunts his pointed fury; in its case,
Russet and rude, folds up the tender germ
Uninjured, with inimitable art;
And, ere one flowery season fades and dies,
Designs the blooming wonders of the next."

—JOHN CUNNINGHAME, in *Midland Florist*.

THE ISABELLA GRAY ROSE.—As the history of this Rose has not been very accurately given in the advertisements, it may be perhaps interesting to your readers to know something more about it. Mr Andrew Gray, who had been first foreman to Mr Buist, of Philadelphia, left him some years since and settled at Charleston, S.C., about eight years ago; the Noisette Cloth of Gold seeded freely with him; from the seedlings raised he selected two, one he called *Isabella*, alias Miss Gray, after his eldest daughter, the other he called Jane Hardy, after his wife; the former has bloomed well in America, but is not equal to the Cloth of Gold in beauty. Jane Hardy does not bloom well; it is like the old double yellow Rose, its buds burst without opening. *Isabella Gray* was sent to England three years ago by Mr Buist, who gave me the above information, but has not bloomed till this season. There is, therefore, but one Miss Gray or *Isabella Gray Rose*, which is likely to prove a very nice free blooming yellow Rose. The Cloth of Gold Rose was not raised in America, as stated in one of the advertisements, but in Angers, in France, about the year 1811.—T. RIVERS, Herts, in *Gardeners' Chronicle*.

GLYCINE SINENSIS.—But perhaps the most beautiful sight of all is the *Glycine sinensis*, climbing upon and hanging down from other trees. I believe I noticed in my former works the fine effects produced by this climber when in such situations. I again observed numerous examples this spring, and cannot help drawing attention once more to the subject. The fine plant of this species upon the Chiswick garden-wall is much and justly admired; but imagine a plant equally large, or in some instances much larger, attaching itself to a tree, or even a group of trees, entwining itself round the stem, running up every branch, and weighing down every branchlet; and, in the end of April or beginning of May, covered with flowers, some faint idea may be formed of the fine effects produced by the *Glycine* in its native country. I believe it would not succeed if managed in this way near London, or anywhere in the north; but the experiment would be worth a trial in some parts of Europe, where the summers are warmer than they are in England. As this description may meet the eye of readers in the United States of America, who are as fond of their parks and gardens as we are of ours, I cannot do better than recommend the experiment to them.—*Fortune's China*.

THE OWNER OF THE SOIL.—The man who stands upon his own soil, who feels that by the laws of the land in which he lives—by the law of civilised nations—he is the rightful and exclusive owner of the land he tills, is by the constitution of our nature under a wholesome influence not easily imbibed by any other source. He feels, other things being equal, more strongly than another, the character of a man as the lord of an inanimate world. Of this great and wonderful sphere which, fashioned by the hand of God, and upheld by His power, is rolling through the heavens, a part is his—his from the centre to the sky. It is the space on which the generation before moved in its round of duties, and he feels himself connected by a link with those who follow him, and to whom he is to transmit a home. Perhaps a farm has come down to him from his fathers. They have gone to their last home! but he can trace their footsteps over the scenes of his daily labours. The roof which shelters him was reared by those to whom he owes his being. Some interesting domestic tradition is connected with every enclosure. The

favourite fruit-tree was planted by his father's hand. He sported in boyhood beside the brook which still winds through the meadow. Through the field lies the path to the village school of earlier days. He still hears from the window the voice of the Sabbath bell which called his father to the house of God; and near at hand is the spot where his parents laid down to rest, and where, when his time has come, he shall be laid by his children. These are the feelings of the owner of the soil. Words cannot paint them; they flow out of the deepest fountains of the heart; they are the life-spring of a fresh, healthy, and generous national character.—*Edward Everett.*

ON THE SUPPOSED INFLUENCE OF THE MOON ON VEGETATION IN PERU.

By ARCHIBALD SMITH, M.D.

This article is extracted from the Report of the Edinburgh Botanical Society for June.

The author alluded to the prevailing belief in Peru of the moon's influence on vegetation, and gave a *resume* of the results arrived at by various scientific observers who had had opportunities of noticing the lunar influence in the tropics. He thought it not unreasonable that the lunar ray might have a peculiar chemical agency on the functions of plants and animals, as it appears to have on dead animal matter. While the moon was not regarded in Peru as influencing so much the changes of weather as in directly effecting increased growth, it must be borne in mind that the light afforded both by the sun and moon in Peru is much greater than in the British Islands—so that, although we may reasonably repudiate any marked effect from the moonlight in these islands, the more intense lunar light of Peru may exercise a sensible power on plants. In noticing special instances in which this might be supposed to be shown, the author alluded particularly to the surprisingly rapid growth of lucern, which is extensively cultivated in Peru, and is evidently much favoured by light, whether of sun or sun and moon together. During the prevailing misty season on the coast (which is the time when the low and maritime sand hills are garnished in grass and flowers to their summits) the growth of lucern in the plains and valleys is greatly stunted. In these wet months, as they are called, though the rain very rarely forms into a light shower, or exceeds the limits of a dripping mist, the clover or lucern does not attain to a flowering maturity; but no sooner do the vapours of the coast begin to break up, and the sun show itself in a brightening sky, than this useful plant, on which the horses and other cattle thrive admirably, receives a fresh impulse, yielding two or three luxuriant crops in succession. This remarkable vigour of vegetation, under the influence of a returning sun, argues on behalf of light, more than of heat, as the vivifying power, because the requisite degree of heat does not appear to be deficient at any season, where the thermometer of Fahr. seldom sinks under sixty degrees on the coast. Besides, in the temperate valleys of the Sierra or Andine heights, where the summer temperature of the air does not exceed the winter temperature of the coast, the lucern grows luxuriantly under a bright clear sky during the dry season, though there also its growth is checked in the cloudy and rainy months; and yet the sunny season of the mountains is subject to night chills, or even frost at certain elevations, whereas the wet months are not so. Light, therefore, seems the essential condition to the recurrence of the more luxuriant vegetation, as observed in the successive climates of the Andes from the headlands of the coast to the temperate agricultural elevation of ten thousand feet, where the lucern still attains a perfect growth in a clear but cool atmosphere of about 60° Fahr. And, then, as we descend into yet deeper valleys, at only six or seven thousand feet elevation, where the rains of the so-called wet season are only slight and transitory, and not to be compared to those which fall at twice this height, the sun is seen throughout the year, and, in the dry months, actually

dazzles in reflected brilliancy from every stone and rock. In these favoured inland valleys there is a predominating sun all the year over; and, in the dry season especially, a profusion of sun by day, followed by a most luminous moonlight, with a calm clear sky. Here, then, so liberal a supply of light from sun, moon, and stars, appears to be singularly favourable to vegetation; and the lucern yields inland, two crops to one on the coast, though the temperature of the air on the coast be in the shade, ten or twelve degrees higher during the dry season, than in the inland valleys under consideration, and this, too, on soil generally inferior to that of the coast now compared with it in strength of vegetation. The author concluded by some observations on the effect of light in promoting the discharge of oxygen from the leaf tissues of plants, showing that light, independently of heat, increased their vital actions.

Professor Piazzi Smyth, in remarking upon Dr Smith's paper, made some observations on the amount of heat given by the moon, and shortly traced the history of this inquiry, detailing many experiments by himself and others, and alluding particularly to the researches of Sir John Herschell, Professor J. D. Forbes, &c.

THE FLOWER SHOWS.

The Flower Shows for the season are now drawing near. The brilliant sunshine, the refreshing showers and genial warmth, both by night and day, are rapidly bringing both flowers and fruit to perfection. For two or three seasons past the weather has been bleak, cold, and barren, and very much against the cultivation of fruits, flowers, and vegetables. The early part of the present season was of much the same character, and a great many of the small seeds either perished, or were destroyed by the slugs as soon as they made their appearance. What remains, however, are now growing rapidly, and if sunshine continues we will soon have a splendid blow of Flora's treasures. It must have been quite evident to any observer for some years past that while Cottager's Flower Shows have been every year improving, Gardener's Flower Shows have in this locality been year after year retrograding. There must be a cause for this evident falling off. And what can that cause be? We cannot ascribe it to indolence, apathy, indifference, or want of enterprise on the part of the gardeners, for every one of them acknowledges and deplures the fact. We think it arises from an absence of knowledge on the part of country gentlemen, not knowing what a flower garden and greenhouse annually require, or a want of taste for the cultivation of the finer description of flowers as they are annually brought to perfection. We cannot for a moment admit that any gentlemen will grudge ten, twenty, or thirty pounds annually for the replenishing of his garden and greenhouse with the finest specimens of Flora's treasures. We know of cottagers that will pay three-pence for a seed, and from 5s to 10s for a plant. But the gardener is in a different position from the cottager. The cottager is his own master; the gardener is the servant of another man, and it cannot be expected that if the master don't lay out money, the gardener can. The gardener, in most cases, is left to his own resources; he may beg, borrow, or steal, or procure new plants as he best can, but they are few and far between who receive a regular supply of the most improved kind of plants as they come into the market. This is an evil much to be lamented on the part of country gentlemen, but it is a fact that is nevertheless true. We do not say that the gardeners are not to blame. Gentlemen cannot know what is required, and it is therefore the duty of gardeners to bring under their masters' notice any new plants and flowers possessing rarity, beauty, and excellence. Also, to lay before them catalogues and price lists of various seedsmen and nurserymen, so that they may be led to take a greater interest in the cultivation of plants after seeing their properties set forth in the catalogues.

Another great evil is the very small amount of interest taken by country gentlemen in attending and supporting the gardeners' flower and vegetable shows. Horticulture and floriculture are just as far from having attained to a state of perfection as agriculture; and what the cattle and seed shows are to the farmer the vegetable and flower shows are to the gardener. What would be thought of the farmer who knew for a certainty that by expending a hundred pounds or so per annum upon a better breed of cattle, better seed, and improved implements, he would soon be doubly repaid for his expenditure, and who yet continued to go on year after year as his forefathers had done before him, as if everything in agriculture had arrived at a state of unsurpassable perfection. He would be considered a fool, and justly so. Yet this is the position in which gentlemen's gardeners in the country are placed. They know that their own labour does not give them satisfaction. They know that they cannot produce flowers equal to some of their more favoured neighbours, who have greater facilities for procuring fine plants and seeds. They know that ten, fifteen, or twenty pounds expended annually would put them in a proper position for so doing; but that sum, though small, is wanting. We know of cottagers who spend a few pounds annually upon flowers, and of amateur florists, not gentlemen, but men living by the fruits of their own labour, spending from twenty to thirty pounds annually for new plants to replenish their gardens and greenhouses. Every year there is something new being introduced, or something old being improved. To keep up a fine stock of superb flowers there must be an annual receiving of new plants, and an annual weeding out of old ones. To the great majority of the public who really know fine flowers, the taste for rich, brilliant-coloured flowers has as much improved as the taste for fine *dress* during the last twenty years. The manufacturer and nurseryman are almost on a par, both parties having their minds always on the stretch to produce something new or more brilliant for the coming season. To those who have a knowledge of flowers, however, it is not the more glaring, gaudy colours that are appreciated as some of the most worthless have more show than those possessing the finest properties. Flowers now are more looked at in a botanical point of view. While we look for the deep, rich, brilliant colour, we never forget size, form, and regularity. All show flowers have their properties as clearly defined and their qualities ascertained by a regular and acknowledged standard as any article of commerce that is brought into the market for sale. As a subject of study, then, for a young family, and more especially for young ladies, where can they find anything more appropriate than the study of botany. In the garden or in the greenhouse, there is no science so pleasant or so universally present to the senses as the science of botany. Go where we will; whether we spend our time in the flower garden, or travel over the heathy moors, or clamber over the mountain's steep; whether we spend our time by the river side, as it slowly wends its way to the mighty ocean, or view in the June light millions of watery diamonds as they sparkle in air, as the waters rush tumultuously over some mountain precipice; or whether we spend our time in the shady grove, the forest glade, or cottage garden; there, and almost every where on God's earth, can we find botanical subjects for contemplation. In the field, in the forest, on the mountain, in the meadow, by the river, and the waterfall we have only to open our eyes and drink in supplies of knowledge.

To the ladies, then, the gardeners' society looks for support. If they are real botanists, they will yearly replenish the garden and the greenhouse with the finest plants that each season produces. A little economy in some other department will enable them to enjoy pleasures and inherit knowledge that at present they may be ignorant of. "There is no study which better illustrates the connection of the natural sciences than botany: if viewed philosophically, it will be found inseparable from physiology, chemistry, geology, physical geography, medicine, and various other sciences. Its relations to medicine are immediate and important; the anatomy and physiology of plants form an indispensable part of the general science of life, and a large propor-

tion of the substances which form the *materia medica* are derived from the vegetable kingdom."

A. T. S., Galashiels.

CALEDONIAN HORTICULTURAL SOCIETY.

The Extra Competition and Promenade was held in the Experimental Garden on 27th June last. The following is a report of the prizes awarded:—

For the best Shrubby Greenhouse Plants, the prize was gained by Mr Lockhart, gardener to Robert Dundas, Esq., of Arniston, with *Tetratheca verticillata* and *Appelexis humilis*.

Mr Lockhart also received the prize for Cape Heaths, the kinds produced being *Erica spuria* and *Cavendishii*.

For the best two Stage Pelargoniums there were four competitors. The first prize was awarded to Mr Reid, gardener to William Wilson, Esq., Broomfield, for Zara and Star (Beck's); and a second premium was assigned to Mr Stewart, gardener to the Marquess of Dalhousie, Dalhousie Castle, for Attraction and Forget-me-not.

For the best four Stage Pelargoniums in 6-inch pots the prize was gained by Mr Forrest, gardener to Messrs Swan, St Brycedale, Kirkcaldy, with Carlos, Lucy, Sanspareil, and Wonderful. A second premium was assigned to Mr Henderson, gardener to C. K. Sivewright, Esq., Cargilfield, for Fair Helen, Petruccio, Carlos, and Seraskier.

For the best two Fancy Pelargoniums, the Silver Medal was awarded to Mr Stewart, Dalhousie Castle, the varieties being Decora and Queen Victoria. A second premium was assigned to Mr Reid, Broomfield, for Carlotta Grisi and Annette; and a third to Mr Forrest, Kirkcaldy, for Decora and Lady Downes.

For the best four Fancy Pelargoniums in 6-inch pots, the prize was awarded to Mr Henderson, Cargilfield, for Erubescens, Formosissimum, Celestial, and Criterion. A second premium was voted to Mr Forrest, Kirkcaldy, for Madame Sontag, Madame Van de Meyer, Lady H. Campbell, and Annette.

For the best two Dark Fuchsias in 8-inch pots, the prize was gained by Mr Walker, gardener to John Mood, Esq., Rosehall, with Prince Albert and Omega. A second premium was assigned to Mr Henderson, Cargilfield, for Countess of Burlington and Prince Albert.

For the best two Light Fuchsias in 8-inch pots, the prize was also gained by Mr Walker, Rosehall, the kinds being Queen of Hanover and Maid of Kent. A second premium was voted to Mr Henderson, Cargilfield, for Maid of Kent and Venus de Medici.

In Roses there was a spirited competition, no fewer than eight competitors having appeared. The first prize was gained by Mathew Buist, Esq., factor to the Earl of Haddington, Tynninghame, whose stand contained the following sorts, viz.,—Geant des Batailles, Baronne Prevost, Jules Margottin, Louise Peyronny, Charles Lawson, Devoniensis, Abricate, Paul Ricaut, Reine des Fleurs, Triomphe de Paris, Adam, and General Jacqueminot. A second premium was voted to Mr Stewart, Dalhousie Castle, for Great Western, Mrs Rivers, Lanei, Eliza Sauvage, Blanchfleur, Charles Lawson, Smithii, Cabbage, Duchess de Montpensier, Devoniensis, General Kleber, and Madame Humboldt. A third premium was assigned to Mr M'Farlane, gardener to C. W. R. Ramsay, Esq., of Barnton.

For Phloxes the prize was awarded to Mr M'Farlane, Barnton, for Miss Lewis, Masterpiece, Rival, and a seedling named Mrs M'Call, in the way of Abdel Medschid Khan, from which it had been raised.

The prize for Calceolarias was awarded to Mr Stewart, Dalhousie Castle, for Falstaff, Sir Walter Scott, George Shelby, and a Seedling.

Several extra prizes were offered by the office-bearers, the first of which (Two Sovereigns), being for the best collection of Stove and Greenhouse Plants, was awarded to Mr Blair, gardener to G. C. Arbuthnot, Esq., Mavisbank, Loanhead. His collection included fine specimens of the following, viz.,—*Tetratheca verticillata*, *Leschenaultia formosa*, *Epacris miniata*, *Mahernia incisa*, *Erica breviflora*, *ven-tricosa superba* and *tricolor dumosa*, *Statice Halfordii*, *Pimelea d. cussata*, *Hoya bella*, *Ixora coccinea*, *Oncidium flexuosum*, *Aphelexis macrantha purpurea*, *Æschy-nanthus speciosus*, and *Clerodendron Kämpferi*.

The office-bearers' prize of one sovereign for the best collection of culinary vege

tables was awarded to Mr John Lyall, Pinkie House, Musselburgh; and the second prize was assigned to Mr Lockhart, Arniston.

In addition to the competition articles, there were as usual a number of extra productions placed on the tables for exhibition only.

From the Nursery of Messrs Dicksons & Co., Leith Walk, there were some fine plants of Pelargoniums, Gloxinias, &c.; from Messrs P. Lawson & Son, Golden Acres, Calceolarias and Heaths; from Messrs J. Dickson & Sons, Inverleith, Pelargoniums, including French Fancy sorts, &c.; from Mr R. M. Stark, Edgehill, rare Alpine Plants and Ferns, including Cheilanthes alabamensis, Gymnogramma Peruviana, Notholaena nivea, Todea pellucida, and other interesting species; from Mr Douglas, Rosebank, several trays of fine Pelargoniums, Roses, Verbenas, &c.; from Messrs Wright, Renwick, & Co., Leith Walk, Dracena nobilis, Sonerilla margaritacea, &c.; from Messrs Downie & Laird, West Coates, fine spikes of Delphinium formosum, Calceolarias, Petunias, Phlox Addisoni, &c.; from Mr C. Alexander, Larkfield, fine specimens of Pansies in pots, Delphinium Hendersoni, Linum grandiflorum rubrum, and new Shrubby Calceolarias; from Messrs Cunningham, Fraser, & Co., Comely Bank, boxes of fine Roses, including Souvenir d'un Ami; and from Mr Handa-ide, Musselburgh, boxes of beautiful Roses, with Herbaceous Plants, and a selection of fine Irises.

From the garden of C. K. Sivewright, Esq., Cargilfield, there were beautiful Fancy Pelargoniums and a plant of Erica Cavendishii; from Professor Syme, Millbank, a beautifully flowered plant of Laptodactylon Californicum; from Mr Anderson, Oxenford Castle, specimens of the Champion Peach and black Hamburg Grapes; from Mr Pender, Moredun, a neatly arranged collection of Fruit and a dish of large Mu-brooms; from Mrs Fraser, Canonmills Cottage, a fine specimen of Oncidium pulvinatum, alpine plants and Ferns; from Mr Lockhart, Arniston, a plant of Cissus discolor; from Mr Stewart, Dalhousie, Gloxinias; from Mr Blair, Mavisbank, Stanhopea oculata; from Mr Buist, Tynningham, fine Roses; from Mr Reid, Broomfield, a box of fine Pansies and Fancy Pelargoniums; from Mr Young, Warriston Cemetery, beautiful Stocks; from Mr Duncan Kerr, West Grange, a Seedling Pansy; from Mr Ferguson, James' Park, Burntisland, Ranunculuses, Roses, &c.; and from Mr Dunn, Musselburgh, fine Stocks. Miss Barnettson, 26, Clarence Street, exhibited a neat group of wax fruit.

Thanks were voted to the various exhibitors.

FLOWER SHOW AT THE ROYAL ZOOLOGICAL GARDENS, EDINBURGH.

The second Flower Competition, under the auspices of the Directors of the Royal Zoological Gardens, took place on Saturday the 18th July, when the following prizes were awarded:—

Nurserymen's Class.

The first prize for six Greenhouse or Stove Plants was awarded to Messrs James Dickson & Sons, nurserymen, Inverleith; 2d, to Messrs Dickson & Co., nurserymen, Leith Walk.

Gardeners' and Amateurs' Class.

For six Greenhouse or Stove Plants—1st, to Mr John Lockhart, gardener to Robert Dunlop, Esq., Arniston; 2d, to Mr John Smith, gardener to Right Hon. Viscount Melville, Melville Castle.

Three Stage Pelargoniums—To Mr Wm. Stewart, gardener to Most Noble Marquess of Dalhousie, Dalhousie Castle.

Three Fancy Pelargoniums—1st, to Mr Wm. Stewart, gardener, Dalhousie Castle; 2d, to Mr Thomas Reid, gardener to William Wilson, Esq., Broomfield.

Scarlet Geranium—To Mr Adam Tod, gardener to James Craig, Esq., Tor, Muirfield. Extra Prize to Mr Charles McIntosh, gardener to Lord Aberdour, New Saughton.

One Dark and One Light Fuchsia—To Mr A. Walker, gardener to John Mood, Esq., Rosehall, Newington.

Six Cut Spikes of Hardy Herbaceous Plants—1st, to Mr David Foulis, gardener to James Tytler, Esq., Woodhouselee, Roslin; 2d, to Mr George Ormiston, gardener to Charles M'Laren, Esq., Moreland Cottage, Grange Loan.

Six Verbenas—To Mr Charles McIntosh, gardener to Lord Aberdour, New Saughton.

Six Hand Bouquets—1st to Mr James Mitchell, gardener to Patrick K. Murray, Esq., Ravelston House; 2d, to Mr J. Fraser, Rosebank.

Collection of Vegetables—1st, to Mr Wm. McAulane, gardener to Captain Milne, R.N., Inveresk; 2d, to Mr William Reid, gardener to the Hon. Henry Coventry, Newhailes. Extra Prize to Mr W. M'Farlane, gardener to C. W. R. Ramsay, Esq., Barnton.

Pint of Strawberries—To Mr William Stewart, gardener, Dalhousie Castle.

Two bunches of Grapes—To Mr W. M'Farlane, gardener, Barnton.

8 x Peaches—To Mr Stewart, gardener, Dalhousie Castle.

Special Prizes.

Messrs Peter Lawson & Son's prize for the best thirty-six named Roses was awarded to Mr David Foulis, gardener, Woodhouselee. Extra awards were also made to Mr Andrew Bell, gardener to John Wedderburn, Esq., Keith House; Mr Reid, gardener, Newhailes; and Mr George Ormiston, gardener, Moreland Cottage. Messrs Lawson & Son's prize for the best six Shrubby Calceolarias, to Mr John Beveridge, gardener, Whitehouse, Inveresk. Messrs Wright, Renwick, & Co.'s prize for best Rose in pot, to Mr John Logan, gardener to William Ivory, Esq., St Roque. Messrs Young & Mackay's prize for best twelve Pinks, to Mr William Young, 33 South Bridge. An extra award to Mr Reid, gardener, Broomfield. Mr Charles Alexander's prize for best Fuchsia in pot, to Mr A. Walker, gardener, Rosehall, Newington. Mr Carstairs' prize for best four varieties of Strawberries, to Mr Alexander Lauder, Goshen Gardens, Musselburgh.

In addition to the articles sent in competition, a large and splendid collection of Greenhouse and other Plants was placed on the tables for exhibition from Messrs Dicksons & Co., Leith Walk Nurseries; Messrs James Dickson & Sons, Inverleith, Nurseries; Messrs Downie & Laird, West Coast Nurseries; Messrs Wright, Renwick, & Co., Leith Walk Nurseries; Mr Charles Alexander, Larkfield Nursery; Mr G. H. Douglas, Roebank Nursery; Mr Thomas Methven, Stinwell Lodge Nursery; Mr R. M. Stark, Edgehill Nursery. Messrs W. Ballantyne & Sons, nurserymen, Dalkeith, sent two boxes of fine named Roses. Mrs Carstairs, of the Royal Emporium, George Street, exhibited a basket of really fine British Queen Strawberries, grown by Messrs G. & R. Moffat, gardeners, Fordledean. Mr Conlon, gardener to Sir James Mathewson, Bart., Lewis Castle, Stornoway, sent some stalks of Rhubarb, which were of a large size, considering they were grown in the Hebrides.

The Judges on this occasion were Mr Thomson, Palace Gardens, Dalkeith; Mr Lockhart, gardener, Arniston; Mr Addison, gardener, Gosford.

CALENDAR OF OPERATIONS FOR AUGUST.

FORCING DEPARTMENT.

PINES.—The succession plants that were shifted in the early part of summer, and that are required to fruit early next season, are now ready for transferring into their fruiting pots, and such should be accomplished as early this month as possible. The only guarantee that these will fruit early with any certainty and satisfaction to the cultivator, is to be found in a vigorous well-matured growth, with, of course, a pot full of healthy roots by the end of October. It is, therefore, essentially necessary that they be shifted forthwith. Twelve-inch pots are sufficiently large for shifting those in eight-inch pots. Drain the pots well, and put a thin layer of the most fibry part of the turf over the crocks to prevent any of the soil from filtering down among and so choking the drainage. For soil a hazely fibrous loam is preferable. See that everything in connection with the house or pit in which these are to be placed is thoroughly cleansed, and a steady bottom heat secured, but be careful not to exceed the bottom heat spoken of in former Calendars. If tan and leaves are the means of supplying the heat, and it should be feared that the heat may exceed that which is proper, it will be much more safe only to half plunge the pots for the present. In plunging give the plants plenty of room, as anything like a crowded condition is undesirable at all times, but more especially during the season of rapid growth. Keep them close for the first ten days, regulating the temperature at from 75° to 80°. Should the

weather be fine and sunny, a slight shading should be used; give slight syringings overhead at shutting up time, at the same time damping the walls and passages, and let no attention be wanting which is necessary to encourage a rapid and sturdy growth. During dry and parching weather, when a considerable degree of air must be admitted, and a great demand is made on the system of the plants, it will be found of great service to shut up with a high temperature early in the afternoon, at the same time giving a most abundant supply of moisture in the air. This for an hour or two will greatly refresh them, and help to prevent that browned appearance so frequently met with at this season—a small amount of air should afterwards be left on for the night, thus preventing a too lengthened continuance of a high and moist stagnant atmosphere. Those required to give a supply of fruit for the winter should be got to start this month. By keeping them rather dry and cool for a short time, and afterwards giving a brisk heat and a good watering, it is often found that those that might otherwise be shy in starting, are induced to “come up.” Give fruit swelling off a high temperature, and plenty of moisture, with alternate waterings of liquid manure. Those that are colouring should have a good supply of warm dry air, and be kept rather dry at the root, in order to insure a high flavour. Pot more suckers, and shift on those well rooted in small pots. Now is a good time to provide a stock of soil; all have their favourite soils and composts. It is, however, pretty generally acknowledged that a light fibry yellow loam is first-rate for Pines.

VINES.—Early houses where the wood is well ripened may now have the lights removed, if they require painting or repairing. Where such can be done now, it is much better to proceed with it than to defer till later, when there are fewer chances of getting the wood-work thoroughly dry; all alterations or improvements in the way of heating should also be accomplished forthwith. Should the weather be dry, late Grapes that are swelling off should be encouraged with occasional waterings of liquid manure, and slight mulchings of dung. But this is only applicable to borders that are perfectly drained, and from which no danger need be feared from stagnation of water. Apply a little fire heat on damp days, and always at night with a little air on all night, in order to create a circulation of warm air about the Grapes, which is most conducive to the colouring process. Take every precaution to keep wasps and flies from ripe fruit; there is no simpler means of doing this than to nail some gauze, or better still, Hawthorn's hexagon netting over the openings for ventilation. Attend to former directions with regard to the preservation of the foliage on Vines, from which the crop is all cut; and if red spider or thrip infests them, get rid of them as speedily as possible. Pot Vines intended for early forcing, should by this time be as brown and hard as a cane, and should be fully exposed to as much sun and circulation of air as possible. Should they show any disposition to make fresh laterals, remove them, and induce the Vines to maturity and rest as soon as possible.

PEACH HOUSE.—As the trees are cleared of fruit look carefully over them, and remove any superfluous shoots which may have previously been overlooked, so as to give room and encouragement to that selected for the ensuing crop. If there be any signs of red spider, lose no time in giving them a syringing with sulphur and water, and otherwise give every possible encouragement that is necessary to thoroughly ripened wood, without which good crops will be looked for in vain. Give plenty of light and air to fruit ripening; and to late crops which are swelling off, give water at the root if the border be dry, and frequent syringings in dry weather.

ORCHARD HOUSE.—Still persevere in the use of the syringe in this department, except in the case of fruit that is ripening and ripe. Pinch the ends off Peaches and Nectarine shoots, and keep in mind the proper ripening of the wood. Should they be inclined still to make fresh growths, the roots which have passed through the pots into the border should be cut off by degrees. This is especially applicable to Figs which are gross feeders.

STRAWBERRIES IN POTS.—These, if shifted into their fruiting pots early last month as then directed, will now be growing apace, and filling their pots

with roots. Give them a liberal supply of water, with occasional waterings of liquid manure, as they get well established in their pots. Do not let them suffer for lack of plenty of room, so as to admit a free circulation of air among their leaves. They should be grown in an open airy situation. If any portion of the necessary stock remain unpotted, not a day should be lost in getting them shifted. The great point to gain with these is a strong well ripened crown, and a pot full of roots, almost to the bursting of the pot.

CUCUMBERS AND MELONS.—Attend to the impregnation of late Melons and do not let them become over-crowded with Vines. Sow Cucumbers by the middle of the month for winter supply. Topdress those in bearing with well-rotted dung; go over them every second day, and remove all superfluous Vines and foliage, and cut all Cucumbers, except those required for seed, as soon as fit for use. During hot weather see that they do not suffer for want of water at the root. For further directions see former "Calendars."

FLORISTS' FLOWERS.*

PANSIES.—Continue to put in cuttings of esteemed varieties as occasion offers, and plant out those already struck, into beds four to six inches apart. From those a selection of healthy plants can be made, either for beds or pot culture. Sow seed as soon as ripe.

CINERARIAS.—Sow seed for late blooming. Continue to put in cuttings, and pot off into single pots those struck, or when side shoots can be got with roots. Fumigate if there is any appearance of greenfly.

HOLLYHOCKS.—See that all are now properly secured to the stakes; water freely, in hot, dry weather. Put in the side shoots as cuttings—a cold frame answers this purpose well. Keep the cuttings as near to the glass as possible. Sprinkle the foliage with water in the evening in dry weather.

DAHLIAS.—As the plants advance in growth, tie out the side shoots so that they may have all the light and air possible; thin out the shoots not wanted when about an inch long—this is best done with the fingers and thumb. The large flowering sorts should be disbudded sparingly. Water regularly in dry weather, and by all possible means keep down slug, earwigs, &c.

CALCEOLARIAS.—These should be placed out of doors where they are shaded from the mid-day sun. Take off cuttings when they can be procured, and be careful that the plants are kept clean from greenfly, decayed foliage, &c.

PELARGONIUMS AND FUCHSIAS.—See last month.

AURICULAS.†—Finish the repotting of the plants as early as possible. Keep them free from decaying leaves and greenfly; give them plenty of air, and a regular supply of water.

POLYANTHUS.—Prepare some compost as early as possible for repotting with. I have found the following to suit them well, viz., equal parts of leaf-mould and maiden loam, with about one-fifth part of its bulk of old cow-dung, and a sufficiency of silver sand; mix it intimately. By the end of the month the plants will be ready for separating. Divide all the rooted plants, and cut away any decayed portion that may be at the end of the stem. Pot in the same manner as recommended for Auricula. Keep them in the shade, and supply them regularly with water.

TULIPS.—Turn the soil intended for the beds, and expose it as much as possible to the action of sun and air. Clean the bulbs from their outer skins and fibres.

RANUNCULUS.—This month, or next at latest, the beds will require to be prepared. The best situation is an open airy spot, free from eddy winds, and on a perfect level. Should the soil be new, remove the top spit to one side, turn up the subsoil a whole spade in depth, looking carefully for wire-worm, grubs, and the large earth worm; destroy the whole of them. Allow the bed to remain in this state for a day or two to sweeten. Prepare some cow-dung, at least a year old, by chopping it small, and mixing some

* By Mr J. Downie, of Downie & Laird.

† By Mr G. Lightbody, Falkirk.

new slaked lime among it, so as to insure the destruction of the worms that are among it; spread at least three inches of it over the subsoil, and return the surface soil in as dry a state as possible. When the beds for these flowers are confined to the same spot year after year, the top spit will require to be changed annually. *Ranunculus* beds require to be enclosed by a wood edging, rising one-and-a-half inch above the surface, the depth at which the roots are to be planted. Look over the roots occasionally, and observe whether they are contracting mould.

PINKS.—Prepare the blooming bed as early as convenient. The same directions as those given for the preparation of the *Ranunculus* beds are applicable to those intended for Pinks. I prefer old horse dung for this flower, being of opinion that it brings out the lacing more vividly. Should the dung be old enough, a stratum of four inches over the subsoil may be given. So soon as the pipings are rooted, take away the glasses, to harden the young plants; at the end of about a week they will be ready for removal. Lift the young plants with as good balls as possible, transplant them into the nursery bed, covering up to their lower leaves. In dry weather they will, for some time, require a regular supply of water. Varieties that are scarce may still be propagated.

CARNATIONS AND PICOTEES.—Complete the layering by the middle of the month, for after that it is too late for them to have any chance to root in our uncertain climate. Continue a regular supply of water in dry weather, through a fine rose. So soon as the bloom is over, cut away the flower stems, remove the blooming sticks, and expose the plants to sun and air, to harden the layers. Should there be the promise of seed from any of the pods, keep them covered with glass. Use every exertion to impregnate fine sorts.

AZALEAS.*—Give specimens intended to flower next season all the light and air possible to mature their flower buds. If young plants are wanted of increased size, keep them in a nice moist growing atmosphere, shading from strong sun.

EPACRIS.—Late cut down plants if well broke should be gradually hardened off and placed alongside the early plants, giving them plenty of room, so that the sun may mature their wood and set their flower buds. Water regularly and carefully.

CHRYSANTHEMUMS.—Continue treatment recommended for last month. Topdress with equal parts maiden loam and well rotted cow dung, previously stirring the surface of the soil. Keep a sharp outlook after earwigs; if numerous they will soon disbud the eyes that are left, and sicken the plant to the bargain.

POMPONES.—The treatment recommended for last month, and the above for large flowering sorts are also applicable for these.

NOTICES TO CORRESPONDENTS.

J. M'DONALD, Aberdeen.—You may depend upon the following 6 *Fuchsias* as being fine and distinct in their classes, viz. —Antagonist (Writtle), Countess of Burlington (Story), Donna Joaquina (Banks), Emperor Napoleon (Banks), Queen of Hanover (Turner), Volcana D'Aqua (Banks).

J. PATON, Oban.—The following are 12 first-rate *Antirrhinums*, viz. —Black Prince, Cretia, Crimson Royal, Firefly, General Simpson, Hendersonii, Lord Raglan, Lelia, Mrs F. A. Snipp, Model of Perfection, Wm. Blackwood, Rob Roy.

R. JOHNSTON.—For Show *Pelargoniums* the following 12 will be found first-class in every respect:—Agnes (Hoyle), Car'os (Hoyle), Eclipse (Dobson), King of Scarlet (Turner), Majestic (Hoyle), Marvellous (Hoyle), Phaeton (Foester), Polly (Hoyle), Resplendent (Hoyle), Serena (Hoyle), Topsy (Hoyle), Wonderful (Hoyle).

D. CAMPBELL.—The curl on your *Calceolaria* leaves is caused by greenfly. Fumigate on a calm evening with tobacco paper till your house is full.

* By Mr Laing, Dysart Gardens.

THE SCOTTISH GARDENER.

THE BEAUTY OF NATURE IN RELATION TO LANDSCAPE GARDENING.

NO. 4.—FORMS OF GROUND.

THE term Landscape Gardening is fitted to suggest such a comparison with Landscape Painting as was probably not intended or desired by those who first adopted it. The name seems to have originated in this way :—The pleasure grounds around mansions were commonly called gardens, particularly by the French, and as these, in the modern or natural style, are composed of scenery, or in more ambitious phrase, landscapes, so the formation of these gardens came to be called Landscape Gardening, and the artists that designed them Landscape Gardeners. We believe that it was Mr Repton who first employed these designations. At the same time, the analogy between this species of so-called Gardening and Painting was made familiar to the public mind by Price's speculations on the Picturesque, and by his earnest inculcation of the study of pictures, as the best preparation for the successful laying out of grounds. It must be admitted, however, that if there are resemblances between these two branches of the fine arts, there are also marked differences. Painting is essentially a copying of nature, even in the cases which are called Composition ; for while the artist is selecting and combining those features of scenery, which perhaps he has never seen together in any actual landscape, he is in fact copying what he has seen in detached places, or at least something like what he has seen. On the other hand, the Landscape Gardener proudly professes to create scenery ; though perhaps he is only arranging or decorating nature after all. In one respect, indeed, this contrast of copying and creating may be held to be reversed. The painter, in the first instance, has a flat surface to deal with ; he has a smooth panel, or

piece of canvas for his groundwork ; and if he is composing, he can put a hill here, a rocky crag there, and a house or a lake, or a level sward, wherever it suits his purpose. The landscape gardener has mostly to accept of the ground formed to his hand ; he seldom can make considerable alterations on it, by artificial operations ; and if prudent, he will adapt his treatment to the natural contours of the locality, and will seek to make the best of the materials thus presented to him. It is sometimes his good fortune not to be required to create, to use once more his large word, but only to modify or to adorn. He has to avail himself of the existing ground in all its diversified configurations ; and hence it is evident that, to him, the study of the natural forms of ground must be a matter of the utmost importance.

The forms or contours assumed by the surface of the earth are the results of those geological forces which have long since passed away, or are now only in partial operation. The effects, however, are permanent, and are wonderfully diversified. The physiognomy of Mother Earth, in different regions, is almost as varied as the features of the tribes that people it—presenting, like the latter, a general sameness, but an infinite diversity in particulars. We have, for example, mountain, hill, crag, ridge, knoll, eminence and swelling undulation—we have strath, valley, dale, ravine, pass, corry, dell, basin, and depression—and we have plains of all dimensions and shapes, and of numerous and varied relations to surrounding scenery. In Wheatley's *Observations on Modern Gardening*—one of the earliest, and as yet the most original work on the subject—there is the following brief analysis of the natural forms :—“ The shape of ground must be either a *convex*, a *concave*, or a *plane* ; in terms less technical called a *swell*, a *hollow*, and a *level*. By combinations of these, are formed all the irregularities of which ground is capable ; and the beauty of it depends on the degrees and the proportions, in which they are blended.” The terms here called technical may perhaps be regarded as sufficient, but the alternative phrases a *swell*, a *hollow*, and a *level*, can surely be adequate only to the tamer scenery of England ; they are very far short of the majesty and variety of nature in her wilder moods.

1. The *Convex* form of surface is one of great variety, and is therefore prized as the fertile source of sublimity and beauty. It ranges from the Alp or Ben, in all “ the wild pomp of mountain majesty,” to the water-worn hillock, which might seem an artificial tumulus piled over the forgotten grave of some Pictish chieftain. Of these, the mountain and the hill scarcely come within the domain of Landscape Gardening ; though, if in sight, they are conspicuous objects in the distant prospects seen from favourite points of view. Indeed, it is one of the principal elements of value in the minor swells, that they afford standing places from which to survey the surrounding scenery, and to look into the blue distance. They are indeed, beautiful in themselves, having often a picturesque or grace-

ful outline; and they exhibit, at different heights and distances, the rocks by which their smooth surface is broken, or the groups or masses of trees by which they are clothed. Convex surfaces, however, have this disadvantage, that the eye of the spectator, while he is standing on them, even in the most favourable positions, can command only a small portion of the details. A man at the top of a hill can generally see only its shoulders, and can form no idea of its lower skirts, which are perhaps the most beautiful of all. To have a complete view of a convex piece of ground, the spectator would require to be raised above it some hundred yards, into the position of a bird's eye; or what is more practicable and natural, must be carried so far into the horizontal distance, that at least one entire side of the elevation may be contemplated at once. Lately, in one of the midland counties of Scotland we observed a fine conical hill of considerable altitude laid out in the form of a park, with grassy glades, and masses and groups of trees up to the top. We learned that it could be completely seen from no part of the connected property; and the thought occurred to us that the worthy proprietor had been designing and planting as much for the pleasure of his neighbours as for himself. Of course, we do not mean to say that such a place has not interior beauties. It is always impressive to look up from below to the swelling brow of a hill crested with rocks or tufted with trees. The prospect downwards and outwards, especially if the vicinage be fine, is perhaps even more attractive. Then there are the side-long views, which at different points of elevation, may be extremely varied. It is on such convex surfaces that the beauty arising from natural perspective is specially apparent, and therefore such surfaces have always been highly appreciated in Landscape Gardening.

2. The *Concave*, or hollow surface, may be said to be correlative to that which we have been considering. Where there are hills there must be valleys—where there are separate eminences there must be depressions to distinguish them from continuous ridges or elevated plateaus. Here, again, we have a similar diversity of subordinate forms, as in the preceding section. How different the ordinary shallow valley, in an agricultural country, from the Alpine valley described by Wordsworth in his “Excursion,” Book Second :—

All at once behold!
 Beneath our feet a little lowly vale—
 A lowly vale, and yet uplifted high
 Among the mountains; even as if the spot
 Had been from eldest time, by wish of theirs,
 So placed—to be shut out from all the world!
 Urn-like it was in shape, deep as an urn,
 With rocks encompass'd, save that to the South
 Was one small opening, where a heath-clad ridge
 Supplied a boundary less abrupt and close;
 A quiet, treeless nook, with two green fields,
 A liquid pool that glitter'd in the sun,
 And one bare Dwelling—one abode, no more!

Like the mountains, the wide straths and alpine valleys are rather beyond the sphere of the landscape gardener, but they, too, often afford beautiful distant views. From the battlements of Stirling Castle, the rich low grounds, east and west, through which the Forth and its tributaries meander, divide, at least, the interest of the spectator with the surrounding mountains. It must be admitted, however, that the narrow valleys and bosky dells which come within the province of the Landscape Gardeners are among the loveliest objects in nature. Their "banks and braes, and streams around" have been the chosen theme of Scottish song, as the scenes of rustic love, and home-spun happiness. There are an unequalled variety, and intricacy, and picturesqueness in these verdant hollows, filled with the "noise of pleasant waters," interspersed as they often are with trees and bushes and Ferns, and set off occasionally with the wilder aspects of brake and scaur. Every step reveals new beauties to the delighted observer. In their single reaches, they are generally more under the eye at once than hilly scenery can be. The salient point, the shoulder as it were, over the spot where two valleys meet, often supplies views of unequalled interest and consummate beauty. Lower down, in the bosom of the valley, the walks and rides are of the most charming character. "In ground that lies beautifully," says Wheatley, "the concave will generally prevail; within the same compass, it shows more surface than a swell; all the sides of the latter are not visible at the same time, except in a few particular situations, but it is only in a few particular situations that any part of a hollow is concealed; earth seems to have accumulated to raise the one, and taken away to sink the other. The concave, therefore, appears the lighter, and for the most part it is the most elegant shape; even the slopes of a swell can hardly be brought down unless broken, now and then, into hollows to take off from the heaviness of the mass."—*Mod. Gard.* p. 7.

3. The *Plane* from its nature is less diversified than the other forms of ground, and yet it admits of some varieties. It may vary greatly in extent and in shape, and in its relations to the other kinds of ground which form its borders. A plain may lie at the foot of an easy slope, or may form as it were a base to a range of mountains rising abruptly from it; it may be the frame in which the meandering course of a gentle river is set; it may be an elevated plateau from which the ground declines in almost every direction; or like the open sea, it may be a broad expanse without any visible boundaries. It must be owned that in itself the plain is the least interesting form of ground. However tolerable it may be when small, it becomes wearisomely irksome where it spreads out without apparent limit, as it does in Holland, North Germany, and in many parts of France. A traveller in the latter country gives the following account of the plain of La Beauce—a little exaggerated, perhaps—in the pages of our lively contemporary, *Household Words*. We premise that he is travelling by rail, and is approaching Orleans.

“ The plains of Champagne are bearable. They are undulating, and you may speak of them in the plural number. . . La Beauce is a plain—and unbearable to those whose senses require other stimulants than corn and cattle. In La Beauce, supposing you are standing on any given spot, you say to yourself—‘ What is the use of stirring? If I go forward ever so far, the scene will be exactly the same as it is here; and if I go forward ever so long, neither my own nor my horse’s legs will ever be able to carry me out of it.’ Take the idea of arable land, as present in the mind of a scientific agriculturist, let it spread itself out to an indefinite extent in all and in every possible direction, like a pint of oil poured on the surface of a lake, as if it meant to constitute itself into a diaphragm of the universe, separating utterly the upper from the lower half of things created, and you have a clear notion of La Beauce. A middle age poet says Belsia (La Beauce) is a triste country, for it is deficient in only twice three things—namely, springs, meadows, woods, stones, bushes, and grapes—all which is true to the present day. There is not a bush nor bramble to be seen, or a good tall thistle for a benighted linnet or goldfinch to hide itself in. The paved roads show the want of pebbles. What is it to us flying travellers that this brown and hedgeless desert consists of fertile loamy soil, which lets at so many francs per hectare? The little, squat, grey, dumpy towns seem to crouch as close to the ground as they can, either because they are ashamed of themselves, or because they are afraid of being swept away by the first fresh gale that blows. The neat, plain, utilitarian buildings are scattered over the land with such regular irregularity, that you take them to have been driven into their present positions by some principle of mutual repulsion; or, perhaps, had been suddenly fixed to the spot in the midst of a grand game of *chasse-chasse*. Everything else is made to give way to the convenience and comfort of wheat and beans, and ploughs and harrows, and of the animals that drag and drive them. You grow sick at the very sight of La Beauce before you have travelled half way across it.—*Household Words*, Part LXVII., p. 244.

We humbly opine that there are parts of the world which would be very glad to get a slice of La Beauce, with its corn and cattle. We own, however, that in a world so plain-looking, the Landscape Gardener’s occupation would be gone. There is nothing like it in this country; neither the Scottish Carse of Falkirk, Stirling, nor Gowrie, nor, as we suppose, for we have not seen it, the famous Salisbury plain in the south. Our little plains are troublesome enough to the designer, when he attempts to *create* scenery upon them, for it is then that his work assumes somewhat the character of creation. They are not indeed altogether without their beauty, but it is a beauty rather of adjuncts than of essential characters. The views from a plain, if at all attractive, are akin to those from the surface of a lake or arm of the sea, where the eye is directed to the hills and rising grounds on shore. This is well put by Wheatley, from whom we again take the liberty of quoting:—

“ A large dead flat, indeed, raises no other idea than of satiety: the eye finds no amusement, no repose on such a level: it is fatigued, unless timely relieved by an adequate termination; and the strength of that termination will compensate for its distance. A very wide plain, at the foot of a mountain, is less tedious than one of much less compass, surrounded only by hillocks. A flat therefore of considerable extent may be hazarded in a garden, provided the boundaries also be considerable in proportion; and if in addition to their importance they become still more interesting by their beauty, then the facility and distinctness with which they are seen over a flat make the whole

an agreeable composition. The greatness and beauty of the boundary, however, are not alone sufficient; the form of it is of still more consequence. The continued range of the noblest wood, or the finest hill, would not cure the insipidity of a flat. A less important and less pleasing boundary would be more effectual, if it traced a more varied outline; if it advanced sometimes boldly forward, sometimes retired into deep recesses; broke all sides into parts, and marked even the plain itself with irregularity."—*Mod. Gard.* pp. 3, 4.

It is hardly necessary to remind our readers that though for the sake of distinctness we have deemed it proper to treat of the forms of ground under three separate categories, the beauty of landscape is mainly dependent on the felicitous admixture of them, combined with the presence of water, or at least of verdure. Much also depends on the scale on which the parts are put together. In narrow wooded valleys one sometimes feels almost oppressed with the overbearing effect of lofty hills and rifted rocks. One sometimes has no difficulty in perceiving that a due enlargement of the scale would transform a picturesque scene into one which would be truly sublime. On the other hand, an undue extension of the scale without a corresponding increase in the boldness of the convex surfaces would merely form what the elder Gilpin felicitously calls "a large featured country." Of course any real enlargement of the scale in any particular locality is beyond the appliances of human art, but the designer should familiarise his mind with these conceptions, that he may have his senses exercised to discern the style of beauty of which the ground he has to deal with most readily admits, and that his taste may be trained to discover the effects which he should seek to realise or to avoid.

To the student of Landscape Gardening we would strongly recommend the fourth volume of *Ruskin's Modern Painters*. It is the most scientific, and the most elaborate treatise on the forms of ground that we have seen. Its range, indeed, is mostly in the Alpine regions, and it is more adapted to the Landscape Painter than the Garden Artist; but it affords admirable models of studies; and a careful reader will be sure to gather from it hints which will be of great use in his pursuit of the humbler but more available varieties of the Beautiful and the Picturesque.

COMPARATIVE HORTICULTURE.

3.—CULTURE OF THE CAMELLIA IN FRANCE.

History.—The single-flowering *Camellia Japonica* was introduced into Europe in 1739. In 1786, the double varieties made their appearance in our glazed houses. Since that epoch the sorts with white, rose, red, and variegated blossoms have so multiplied, that their number amounts to more than 700. They form an important branch of horticultural commerce; and fashion, so changeable in its tastes, appears to have remained constant in their favour.

Relations to Climate.—In Italy, and in the south and part of the centre of France, the Camellia lives in the open air, and attains to large dimensions. In the climate of Paris and of the north of France, the shelter of glazed structures is absolutely necessary. In the open ground the culture is simple. They are planted as shrubs, and in soils varying according to the country—in peaty earth, in light free loam, or in compost formed of the decayed wood of the Chestnut tree. They are trained into various shapes, such as bushes, pyramids, or with heads on tall stems. The inconvenience of this method of cultivation is, that as the Camellia blooms in winter, the flowers cannot resist the severity of the season, and therefore fade almost as soon as they open. On this account, the amateurs of such countries cultivate it in houses, either in borders or in pots, or in boxes or tubs, in order to enjoy completely the duration and the beauty of the flowering season.

Propagation from seed.—In the hands of gardeners and amateurs, the single Camellia Japonica has borne fruit, and yielded fertile seeds, so that a series of varieties, springing from the seeds, have speedily eclipsed the primitive type of the species. New “gains” appear every year, and supplant the older sorts, or take their places by the side of those established kinds, such as *Alba plena* and *Imbricata rubra*, which will never disappear from our collections.

Propagation by Grafting.—Attempts have been made to multiply the favourite double sorts by means of layers or cuttings, but satisfactory results have been obtained only by grafting on the single Camellia, or the cognate Tea-plant, principally the former. These stocks are propagated by layers and by cuttings.

To procure stocks from layers, a certain number of single Camellias are planted in peaty earth formed into beds in a pit or frame. The plants are cut down to the ground to oblige them to throw out numerous shoots, which are layered the following season. At the end of a year they are sufficiently rooted; they are then severed from the stools and potted, and in another year they are fit for grafting. During the season of the layering, the stools push up new shoots, which are layered in their turn, and so on for a great number of years. Such for a long period has been the method of multiplying the single Camellia; but it has been found that by layering the branches while they are still herbaceous (soft-wooded), they root much more rapidly, and they can be cut away and potted the same year.

The most common way to procure stocks is by cuttings. Shoots are taken from the single, or pink varieties, which are kept growing, not potted, in a pit for the purpose. The shoots are from branches of the preceding year, about four or five inches long. They are put closely together in earthen pans, filled with well sifted peat earth. The pans, covered with bell-glasses, are sunk in the tan of a pit constantly shaded. From time to time the glasses are taken off, and wiped

on the inside from damp or slime, and the cuttings are occasionally sprinkled by means of a little watering-pan made for the purpose. Thus treated, they root in about six weeks; and when the roots are sufficiently developed, they are transplanted into very small pots, in which they remain till they are grafted. Cuttings are also made from the branches of the single *Camellia*, which are cut off from the stock in cleft grafting, or in grafting by approach. These cuttings are dealt with in the same way as those mentioned above.

Camellia stocks may be grafted when they are one-fifth of an inch in diameter, or when they are much larger; and in the latter case the result is more speedy and satisfactory. Double *Camellias*, whose flowers do not please, may be re-grafted with new sorts; and these grafts push with more vigour than when they are inserted into weak stocks. At first, *Camellias* were grafted by approach, and subsequently by means of cleft-grafting under a bell-glass, by herbaceous grafting, &c. Side (or whip) grafting, proposed by the Belgians, is also in use, and may be advantageously employed when cleft-grafting has failed.

Culture.—The cultivation of the *Camellia* under glass is not difficult, and almost all horticulturists succeed very well in it, though they employ different methods. We specially recommend to amateurs the growing of them in earth-beds in a winter garden or conservatory. In these conditions the plant grows most vigorously. Perhaps in the first years the blossom is less abundant, but the lost time is soon recovered; and the smaller number of flowers is more than compensated by their size and duration. The winter garden or conservatory may be placed in any aspect except direct north. A deep-rooted prejudice has established it, as a thing ruled and determined, that the *Camellia* does not love the sun; but experience has proved that solar heat is indispensable to a vigorous and stubby growth, and a rich blossoming. In the shade the *Camellia* becomes drawn, blooms little, and instead of handsome bushes, or graceful pyramids, it forms only slim blanched affairs, bearing scarcely more than a flower or two at the extremities of the branches. The conservatory may be laid out as an English garden; the walls should be covered with *Camellias* trained on trellises, which we recommend to be kept half-a-foot from the wall, to allow the air to circulate. The spaces on the floor of the house are to be filled with groups of *Camellias*, arranged according to their height, contrasting, as much as possible, the forms and colours of the different varieties; and avoiding too close planting, for if crammed together, they will shoot up, and grow bare beneath, and will soon form a mass displeasing to the eye; the blossoming will be injured; and in the course of a few years it will be necessary to remove the half of the plants. Culture in this sort of house has also the advantage of avoiding the hard work arising from re-potting, and the carrying out and in of pots and boxes. The only cares that are necessary are to renew, each year, the surface of the soil by some fresh earth, and to remove for some months the sashes

of the roof of the house, substituting, in their place, light screens, to protect the plants from the direct action of the rays of the sun.

Waterings, too, may be managed with less precaution; for in such circumstances excess of humidity is not attended with such injurious effects.

When the conservatory system cannot be adopted, cultivation in pots or boxes must be followed; and we, above all, recommend the use of buckets (baquets) or conical tubs, which possess at once the advantages of earthen pots and the old cubical boxes. Generally speaking, Camellias should be re-potted once a year. The choice of the soil is a condition essential to success; and yet, hitherto, nothing has been fairly settled on that point. Each country has its own usages, and it is to be regretted that routine has not yielded to conscientious experiment. In England compact soil is employed; in America light loam; in Belgium, for the most part, decayed leaf-mould; in Italy compost of rotted wood, or marly argillaceous earth, from which it is said excellent results have been had. Lastly, in France, we employ peat-earth, more or less pure, and of different quality, according to the locality. Till some proof is given to the contrary, we counsel the use of peat-earth, somewhat sandy, but rich in decayed vegetable matter. A proportion of leaf-mould or of well-rotted wood may be added; but with the greatest prudence, for this we recommend rather as the subject of experiment than otherwise. The drainage of the pots or boxes is also indispensable, and it ought to be effected, as in the case of Azaleas by means of crocks and the fibrous refuse of Moss. What we have now said relatively to soil and drainage, is equally applicable to the conservatory. The spaces, in the latter, destined to receive the Camellias should be excavated to the depth of 17 or 20 inches, and should be filled with about 3 inches with the fibrous refuse of peat above mentioned, 3 inches of light sand, and 12 or 14 inches of peat-earth, well broken, but not screened, or of other compost such as may be preferred.

The time of re-potting cannot be fixed with precision; according to some, winter is the most favourable in January or February, or in summer in the month of July, that is, between the two flows of the sap; according to others, it should be in April or May, or in the month of September, at the period of housing. Without deciding on these points, we counsel re-pottage towards the end of June. At that date the pushing of the Camellias has ceased, and the change of the soil gives a fresh impulse to the sap, and enlarges the buds formed on the spring shoots. It appears to us that re-potting at other seasons must be attended with grave inconveniences. In January and February the derangement of the roots at the moment of blossoming may injure the development of the flowers, or even, if the temperature is mild, may give an undue excitement to the sap, and cause the flower buds to fall off. In May, the plants deriving excessive energy from the fresh soil may throw themselves into wood, and fail to form flower buds. Lastly, in September, the re-potting

may be accompanied with the same danger as in winter, viz., of throwing off the buds, and of deranging the course of the sap. We nevertheless do not lay down any absolute rule; in certain circumstances the intelligent cultivator may re-pot at any season.

Watering.—The precautions to be taken in watering call for the particular attention of horticulturists. Rain or river water is to be preferred; the water of springs or pump-wells should be used only in cases of absolute necessity, and in these cases it should be ameliorated by the aid of chemical re-agents, which may neutralise the salts it holds in solution, or it should be enriched by the addition of manure. This addition of manure, however, requires much prudence. Cow dung, or the droppings of horses and sheep appear to be the most suitable. In Belgium *poudrette* is used, but that requires great caution. Besides, manure should be applied only in summer and during the period of growth. The temperature of water should be nearly the same as that of the soil, and should never be used to excess. Too much humidity decomposes the soil and rots the roots; on the other hand, extreme dryness arrests their development, and consequently, the vegetation. Besides waterings, frequent syringing should be given, particularly in spring and summer. This operation produces excellent effects on the growth of the Camellias; it favours the development of the leaves, and destroys the insects which attack particularly the young shoots. The watering and syringing should begin in the sunny days of February, and should increase progressively till the month of July; at that date they should diminish gradually in order to discourage the rush of the sap, to direct it to the formation of flower buds, and to prevent the blanching of the plants. During winter, water should be given only on bright sunny days, and when it is strictly necessary. Camellias absorb an enormous quantity of moisture; it is proper, therefore, to pour water frequently on the earth round the pots, and on the paths in the houses, for the evaporation of that water is one of the great agents in their growth.

Admission of Air.—To favour the action of the air we recommend that they should be set as wide as possible, whether in the open air or under glass. The most propitious season for bringing out the Camellias is in the month of July, shortly after the re-potting; for the vernal shoots prosper most under glass, the young branches ripen more promptly, and the flower buds form better. The position to be chosen in the open air is an aspect enjoying half the day's sun (mi-ombre), towards the east if that is possible, and with a free circulation of air. Camellias should be begun to be housed in the second half of September. The house which best suits them is a pit looking to the east or west, and not too dry. They should have as much air as possible. Cold is not injurious unless it becomes excessive. The temperature should not be allowed to sink below the minimum of 36° or 38° ; this should be secured, either by some heating apparatus, or by covering the pit completely with leaves, from the

beginning of December to the end of March. At the latter date the leaves must be removed, and the plants will be found in perfect health, and their flowers will begin to open. They require no sort of care during these four months. The sole inconvenience is that the flowers are later in expanding.

Cleaning of the Plants.—Every year the toilette of the Camellia should be attended to at least once; in other words, every leaf should be carefully wiped with a piece of flannel, and the best time to do this is when the potted plants are carried into their winter lodgings, or after the sashes are replaced on the roof of the conservatory. The pots should be set on sand rather than on planks or wooden shelves. Means of shading should be provided at an early period of spring.

Pruning.—The Camellia yields itself readily to pruning and takes any shape that is desired. Some varieties are less pliable than others, but when planted out in the ground they do not resist the directing hand. The pyramidal form is, without doubt, preferable to all others; and to attain it an early commencement should be made. At the end of the first year, the young graft is cut back to the first or second eye of the autumnal shoot. In spring the terminal bud and the lower ones expand equally; the young Camellia sets out with three or four branches; which treated in a similar manner each year soon lead to the formation of a complete pyramid. Pinching may be adopted during the growth, but it requires considerable address, for it may merely result in the over-development of the bud immediately below the point pinched off, to the prejudice of the others, and so nothing will be gained.

Thinning of Flower Buds.—To obtain fine flowers some advise the removal of certain buds to favour the development of others. This operation may be proper when several buds are closely set at the point of a branch; but unless in that exceptional case, the practice is not to be commended, for there is the risk of cutting off a vigorous and solid bud, and of leaving one which is less so, and which may fall off before it expands.—*Arranged and abridged from Le Bon Jardinier, 1857.*

MANAGEMENT OF CAULIFLOWER.

CAULIFLOWER is the most delicate variety of the Brassica family. It has been in cultivation in this country since the beginning of the seventeenth century, if not sooner.

This is a highly esteemed vegetable; it has been called by some "The best flower that grows in the garden." Not being altogether hardy in this climate it requires the protection of glass during the winter. To keep up a regular supply, four sowings are required. For the principal crop under glass, sow out of doors in the middle of August, the plants to be afterwards transplanted into frames to

stand through the winter. Sow again about the middle of February under glass; a third time at the latter end of March; and the last sowing at the latter end of May.

The principal crop should be sown in a prepared bed; for a bed 4 feet by 3, a $\frac{1}{4}$ oz. of seed will be sufficient. The plants from this sowing will be ready for transplanting into the frames about the latter end of September, and a bed should by that time be in readiness for their reception, which may be prepared as follows:—Choose a partially shaded situation exposed to the meridian sun, dig in and mix well with the soil, a small quantity of hotbed dung; when this has been done, level off the ground. Select from among the plants those which are straight and well-shaped, and dibble them in 4 inches apart each way, being guided as to the number by the probable demand, and place over them a one or two light frame as may be required.

During winter they will require to be looked after occasionally, and all decayed leaves removed, stirring the earth now and again, which tends to promote the health of the plants. When the frosty nights are making their appearance, it will be as well to have some mats at hand for the purpose of laying on the glass, the better to prevent the frost from entering the frame. Double mats will, in most cases, be sufficient. Attend to proper ventilation during the day, except in time of severe frosts, when it will be advisable to keep the sashes close down, allowing the mats to remain on at the same time until the appearance of fresh weather, when they can be opened gradually for a day or two, afterwards giving them an abundance of air by tilting up the sash or sashes. By attending to these directions, healthy plants will be obtained.

About the middle of February is a good time to make a sowing, to succeed those that have been in the frames all winter. As the weather in most cases is too cold at this period to allow sowing in the open air, it is necessary to have a slight hotbed, composed of dung and leaves, mixed for a one-light frame, building it to the height of $2\frac{1}{2}$ feet at the back, and 2 feet high in front. After the bed is finished, place the frame over it, for a day or two; when the rank heat has abated, take off the glass, and lay on about 6 inches of fine light mould all over the bed; and a small quantity of the (Early London) seed scattered thinly and evenly over the bed, covering it lightly with the soil indicated, raking it smoothly afterwards. Place on the glass, until the plants appear, when the sash must be tilted up a little at the back, to admit of air to strengthen the plants; and in no case allow them to be drawn up weakly, as they never prove such nice plants as when they are more stocky.

When they have two or three of their leaves an inch broad, transplant to a bed of rich earth (but previous to doing this, sprinkle a little soot over the bed, it gives the plants a fine healthy appearance), 4 inches apart to attain strength; place over them a one or

two light frame as may be required, and allow them an abundance of air. As the season advances, the glasses can be removed to harden them off, and by the end of April they will be in good condition for planting out in their permanent place of growth.

Another sowing may take place about the latter end of March, in the open air, to succeed those sown in February; choose an open piece of ground for this purpose, away from the drip of trees, adopting the method recommended for the August sowing; and when these are up, and have two or three of their leaves an inch broad, transplant to a bed of rich earth 4 inches apart; by this method they will be found to be fine stocky plants, and will be in condition for planting out to their place of growth about the latter end of May.

The fourth and last may take place about the latter end of May, preparing a bed of rich earth in any open situation. The bed for this purpose may be 4 feet by 3; scatter the seed thinly over the bed, and cover it lightly with the earth from each side of the bed, afterwards raking it gently. If the weather is dry, the bed will be all the better of being supplied occasionally with water, which will encourage the growth greatly. Transplant the young Cauliflower into a nursery bed, adopting the method recommended for those sown in March; this will cause them to be more stocky, and to be much sooner in use, as they will be ready for planting out in the month of July.

A piece of good ground exposed to the meridian sun should be chosen, and a quantity of rich manure spread over it from 3 to 4 inches, about the 1st of November. It should then be turned up in a rough state and left in that condition all winter, so as to receive the benefit of the winter frost and rain as much as possible.

By the middle of March if the weather is answerable, the ground that was turned up in November will require to be slightly pointed over. When this is finished, proceed to mark off the drills at the distance from each other of 2 feet, and put the plants 2 feet apart in the rows; stretch on the line; a number of small pits must then be formed at the above distances, of 1 foot in diameter each, for the reception of the prepared mould to which a small portion of well-rotted dung may be added. Remove from the nursery bed a number of plants, being guided by the probable demand, observing to have a good ball of earth attached to each plant. Place one plant in each of the holes that previously had been filled with the prepared mould, and cover the roots in with the common soil, firming them well in as the planting is being performed, and taking care not to cover the heart of the plants, as by doing so they would be injured. By this plan excellent Cauliflower will be in use about the middle of June. The above directions are applicable to all the other plantations of Cauliflower, with this exception, that those planted out in July will require to be placed at the distance of only 20 inches each way.

When the heads begin to expand, they should have the outside leaves folded down over the white, so as to prevent the scorching rays of the sun from injuring them.

J. F.

A FEW MORE HINTS CONCERNING WINTER FLOWERS.

BY MR R. ERRINGTON, OULTON PARK, TARPORLEY.

ALREADY in the prime of summer, as regards the floral world, many will begin to anticipate the dreary blank which must occur when the icy monarch ascends his throne. But what is the blank in our plant-houses in these times, as compared with such a century ago? I well remember the character of an ordinary greenhouse fifty years since. Such things in these days would convey a better idea of progress, and of the present proud position of gardening, than my pen can depicture. On moss-grown shelves, crammed to the very ceiling, might be seen bony *Geraniums* of the old Cape species, such as *cucullatum*, *gibbosum*, the old peppermint scented, a few of the horse-shoe kind; huge, gaunt, and just surmounted by a head-dress of foliage; then a few bushes of the old rose-scented kinds, containing in their interior, a forest of decaying leaves. But we had Tree sedums, the old *Veronica decussata*, *Phylica ericoides*, *Lavendula dentata*, and the now called *Aloysia citriodora*; then *Verbena triphylla*, big Oranges, big Myrtles, Cape Mallows, and let me not forget the old *Coronilla*, which was, perhaps, the gayest of the lot in winter; and which, when well grown, will continue one of the most respectable old plants in the kingdom. Sundry other things there were, but amongst these may be found the very staple of an ancient greenhouse stock.

Gardeners in those days were exceedingly starchy as to rules—they even ruled Nature. The greenhouse plants must be set out of doors the moment Walnut leaves were the size of a dollar; no matter whence they came, or what their habit: these men did not care a fig about climate or peculiarities—they were greenhouse plants; and about midsummer was the time to pot all greenhouse plants, want it or not. This very naturally reminds me of the joke concerning an honest Hibernian schoolmaster, who made a practice of flogging all his pupils every Saturday night; he reasoning thus—that those who did not then need it, very soon would. But enough of this picture, which the readers of the *Scottish Gardener* will perceive is simply introductory, and by way of illustration.

To come, then, to winter flowers of the present day; I wish to direct attention to a few points in culture, which are worthy

of particular note. It is well known that in these times winter flowers become a special consideration on the part of good gardeners—not only special as to forcing or winter treatment, but also as to those preparatory steps which are requisite in order to ensure success. Perhaps I may here with propriety offer a list such as occur to my memory, out of which I may afterwards select a few by way of illustration. The following list may be too copious for the amateur in a small way; I will, therefore, mark the most important; the others are eligible only under peculiar advantages.

PLANTS WHICH MAY BE HAD IN FLOWER FROM NOVEMBER TO APRIL,
BY FORCING, OR OTHERWISE.

Chrysanthemums.	<i>a</i> American Shrubs—forced.
Chinese Primrose.	Cinerarias.
Mignonette.	<i>e</i> Lachenalias.
<i>e</i> Dutch Bulbs.	<i>e</i> Guernsey Lilies.
<i>b</i> Salvias—splendens and gesneriflora.	<i>c</i> Poinsettia pulcherrima.
<i>e</i> Cyclamens.	<i>c</i> Euphorbia jacquiniiflora.
<i>b</i> Geraniums—scarlet, and the forcing kinds.	<i>b</i> Gesnera oblongata.
Lily of the Valley.	<i>e</i> Tropæolums.
Violets.	<i>c</i> Phaius grandiflora.
<i>a</i> Roses—various.	<i>a</i> Mezereon.
<i>a</i> Honeysuckles.	<i>d</i> Daphne odora.
<i>d</i> Winter Heaths.	<i>c</i> Francisceas.
<i>d</i> Coronillas.	<i>d</i> Oranges—especially the Otaheite.
<i>a</i> Rhododendrons.	<i>d</i> Chorozemas.
<i>d</i> Camellias.	<i>a</i> Ribes sanguinea.
<i>d</i> Azaleas—Chinese.	<i>a</i> Deutzias—gracilis, crenata.
<i>d</i> Correas.	<i>d</i> Cytissus; racemosus, and others.
Dielytra spectabilis.	<i>d</i> Polygalas.
Cypripediums.	<i>c</i> Justicia salicina.
<i>b</i> Cereus truncatus.	<i>c</i> Eranthemum pulchellum.
<i>c</i> Begonias—several.	<i>d</i> Epacris.

ABBREVIATIONS.—*a*—Deciduous Shrubs; *b*—Greenhouse Shrubs, soft-wooded; *c*—Stove plants; *d*—Hard-wooded Greenhouse plants; *e*—bulbs, &c. Those blank, of a miscellaneous character.

The above list comprises many of our most useful winter tribes; more may be added, and amongst them a few novelties; but those who will enter fully into the culture of these, will possess a gay and interesting plant-house, from the end of October to May-day or later. There are also a few nice Orchids, well adapted for winter flowering; and amongst them I would point more particularly to—Zygopetalum, Mackai, Oncidium ornithorynchum, Cœlogyne cristata, Dendrobium nobile, cærulescens, Pierardi, &c.; Cymbidium sinense, Odontoglossum pulchellum;—to which a dozen more might be added: these, however, are easy to cultivate.

Now, what I wish to point to here, is the propriety of taking preparatory steps in the preparation of the plants. I may advert to the classes into which they are thrown by the abbreviations:—Deciduous shrubs (*a*) require an early and perfect growth, and as early a rest as possible: such things as hardy American plants,

which blossom mostly on the terminal points, will not bear what gardeners term pinching. They may be taken up with balls of earth in the middle of October, potted and immediately plunged in cinder ashes, in a shady situation: not under the drip of trees. But some other things, as the *Deutzias*, *Ribes*, &c., will be improved by pinching any rampant shoots. Greenhouse shrubs (*b*), soft wooded, will be found to demand more pinching than any in the list; some are pinched to retard them, and nearly all to render them bushy. Stove plants (*c*) mostly require pinching, and are best pushed forward by means of bottom heat early in the summer. There are, however, several exceptions here, but the very habit of growth of the respective kinds will show the mere tyro what they demand in this respect. Hard-wooded Greenhouse plants (*d*) need little more than the ordinary treatment of what are termed New Holland plants: such are generally pruned back soon after they have done blossoming. But those intended for winter work should, if possible, be excited to early growth by a slight forcing process. The temperature suitable to early *Camellias* will be found to suit most of this section; *Azaleas*, *Polygalas*, *Epacris*, *Correas*, *Chorozemas*, &c., fall in very well with this treatment. A temperature of 55° minimum and 70° maximum, with a light shading, and a tolerably moist atmosphere, are the conditions they all delight in whilst undergoing this process. Bulbs (*e*) are so well understood in general, and their habits so decided, that I need not enlarge on their treatment beyond a few remarks. As to Dutch or imported bulbs, one of the main points is to obtain them directly they arrive, and from reputable persons; to pot them immediately, placing them in any warm corner of the garden, and to cover them at once quite four inches in depth with cinder ashes. From hence—when their pots are full of fibres, in the end of October—they may be removed in successive batches to any mild structure, and, if convenient, to a bottom warmth of about 65° maximum.

I may now advert to the miscellaneous class—those without references. The Chinese Primrose everybody is acquainted with; this may be called the stop-gap of the winter Greenhouse, for when a heavy demand occurs for ladies baskets, or for other decorative purposes, in the dead of winter, it is well to have plenty of blooming pots of Chinese Primroses to fall back on. These sown early in April, and highly cultivated, will blossom finely by the early part of October, and continue all the winter. *Mignonette* sown in August, or even some seedlings transferred to pots from the open border, will prove very interesting in November and up to Christmas. *Chrysanthemums* are too well known and too popular to need a lengthened description. These form the chief connecting link between the old year and the new, and no modern plant-house can be satisfactory without them: and now we have such an early class of *Pompones*, their duration is much lengthened. *Lily of the Valley* is as easily forced as *Asparagus* or *Seakale*,

and on precisely the same principles ; who would be without this in a January or February bouquet if they could avoid it? Violets too, genuine Neapolitans ; some without pretensions to political leaning prefer Russians ; what a winter luxury for our ladies ! they need little more than safe protection or immunity from wet, frosts, and confined damp in the frame : an enemy in the castle may prove nearly as dangerous as the besieging party. And here I must beg to point to a fresher favourite, the *Dielytra spectabilis* ; a Fumewort as our popular botanists term it. As not every one is quite familiar with its habits, I will for brevity's sake state its movements last winter with me. I took up some stout plants from the open border in the middle of September, put them in roomy pots in a sound loamy and rich soil, and immediately placed them behind a wall in the shade. In the end of October they were removed to a Camellia house, and merely placed in the shade of the Camellias which were kept in a damp atmosphere ; here they had a little water occasionally, and in the end of November were far advanced towards blossoming, without any of what are termed forcing appliances. They were simply introduced to the front shelf of a mild greenhouse just after Christmas, and during part of January and all through February were the delight of all who saw them. We have not a more elegant winter plant than *Dielytra* ; but it abhors forcing in the strict sense of that term : the fact is, it is readily excitable after being well fed in the open border, and after a slight amount of comparative rest as far as temperature is concerned. Let me now advert to the *Salvia* family as being most welcome in the conservatory, during November, December, and January ; but all depends on the way in which they are handled. The two best of the whole breed for this very purpose are, in my opinion, the old *S. splendens*, and *S. gesneriflora* ; the first scarlet, the second blue. Cuttings rooted by the beginning of June, potted in their final pots betimes, and hardened off gradually ; should be placed out of doors in a sunny situation from the end of June to the middle of September. During this period they must be liberally watered, and every disposition to blossom kept in check by pinching. About the end of August the pinching must cease, and they may be housed in the course of September, anywhere out of the reach of frost.

But let us come to our old favourites, the Scarlet Geraniums, so much in request for the winter bouquet, as well as for the adornment of our plant houses. The great thing with these is to reserve plants of a woody character, especially for winter work, in May or June. These, being finally repotted in plain loamy soil, should stand out with the *Salvias* and such things through the summer ; every disposition to blossom sedulously averted by pinching. All they require, when housed in September, is a light situation and a dry atmosphere ; and by the help of a little liquid manure occasionally, they will astonish the cultivator. As for the "forcing" Geraniums,

they form another class, and require a slight difference in treatment. I must for the present pass these by. The Begonia family is very useful and ornamental during the winter. Such as *B. incarnata*, *B. fuchsioides*, *B. manicata*, &c., albeit somewhat old-fashioned, are of great service in sustaining the general effect of a plant house. All that they need is very early propagation, a speedy and generous course of culture until Midsummer, in-doors, and then to be placed out in a sheltered situation until the end of August, by which time their shoots will be bronzed; the criterion of ripeness, and by consequence of the flowering principle. A light situation, tolerably warm, and the application of weak liquid manure, will cause them to produce blossoms abundantly through December, January, and February; indeed they scarcely know when to stop. I might add enough here to make a book, as to the peculiarities of even the few plants selected in order to garnish a winter house, but must close the matter by advising those readers of the *Scottish Gardener*, who desire such things, to sound the note of preparation in due time. No person need feel compelled to cultivate all; but what they select they should endeavour to cultivate in a proper way.

Before I close the subject, let me point to the eligibility of a few annuals as adjuncts of a spring plant-house. Sown in the first week of September, and preserved in frames through the winter, they will prove of much service. The *Nemophilas*, *Collinsias*, *Gilias*, *Clarkias*, and some others, are eligible for this purpose.

HOT WATER CIRCULATION.

I AM sorry that Mr Anderson should apparently be so much disconcerted by the few remarks I made on his assertion in the June Number of the *Scottish Gardener*, namely, "That there is little or no circulation in the pipes till the water boils in the boiler." Mr A. may be assured that it was in no Quixotic spirit that I touched upon the subject at all. But on perusing such a statement—which appeared to me to be no slip of the pen—I felt that as a learner I had something approaching to a right to know if such information, so gravely stated, was correct. My readers can see that I did not deny the truth of the assertion, but have simply stated that it was contrary to what I had previously learned and believed, and wished to know whether it was *bona fide* correct. And if I have read any "fine lesson" to Mr A. on what he terms "practical as well as philosophical science," I had no such intention, nor do I see that he is warranted in placing me in the philosopher's chair, especially when he considers me so very unfit—a consideration which I am not ashamed to confirm.

If it be—as Mr A. says it is—a "hypothetical theory" of mine,

that "if boiler and pipes are properly balanced, there is no such thing as boiling in the boiler at all, and that such is not necessary to a most rapid circulation," I would most gladly yield to that which Mr A. seems to defend at all hazards. I am not now going to make a further parade of my ignorance, by asserting the correctness of my so-called "hypothesis," with something akin to imperious dogmatism. Albeit, I would submit, that if what I have hitherto believed be a "hypothetical theory," I would ask if anything in the shape of proof that Mr A. has advanced proves that his position is anything more.

In June Mr A. asserts that "there is little or no circulation in the pipes till the water boils in the boiler." In July he corrects this blunder by saying that what he intended to convey was—"And as we have more or less circulation in the pipes before the water even boils in the boiler." In August he says—"I admit that it is perfectly possible to heat a house or houses without boiling water in the boiler where no great application of fire-heat is required." Really, Mr Editor, if any of these were "typographical errors," it is enough to allay the most inveterate itch for writing, for fear of having such spectres rising before us with your monthly issue. If an "Old Stoker" had been the author of such, I am sure Mr A. would have been quite justified in styling them "ridiculous," and even in "graduating" a step further, and saying that an "Old Stoker" wrote about a subject that he did not fully understand.

Whether Mr A. be right or wrong, I must confess to a want of common perception if he has given sufficient ground or proof for so confidently asserting that the water does ever boil in the boiler if the pipes and boiler be properly balanced, and somehow I cannot make myself set my seal to it, *Ipse dixit*. I hope Mr A. will not consider me impertinent—if "ridiculous"—for daring to call in question what he, as an instructor in hot-water affairs, has advanced; and I can assure him I do so, not in the spirit of retaliation nor of "joking."

My reasons for not having yet subscribed to the "boiling" side of the question is, because men of great experience have confirmed what I have myself deduced from the workings of heated water. I feel myself quite incapable of entering into any danger which might arise from water in a boiler, or any part of the pipes being heated beyond the boiling point. I am not scientific enough for this. But I remember of once having been set a thinking by a tremendous rush of steam from an air pipe not far from the boiler, the cause of which I soon found to be all the valves turned, and the water confined to a 5 feet saddle boiler and a few yards of piping, with what a stoker would call a strong fire. But leaving the various items which, no doubt, might be deduced from such circumstances, I will turn to something that I am a little more able to deal with.

If a sauce-pan full of water be plunged in a fire of red-hot coals, and allowed to boil at the gallop, and if with another vessel you remove from it a sixth or eighth part of the water, and let it stand for two or three minutes, and then pour it into the boiling water in the sauce-pan, it at once ceases to boil. Or, if you drop an egg into a pint of boiling water on a most powerful fire, it at once ceases to boil. These facts are current to any old woman who never saw a hot-water apparatus. Mr A. denies that one or two thousand feet of piping can be heated so as to get the heat desired in respective houses "without the water boiling in the boiler." With the foregoing homely facts in view, let us suppose a boiler, to which is attached say 1300 feet of piping holding 500 gallons of water, every drop of which—according to Mr Thomson's calculation in the *Scottish Gardener* for June—passes through the boiler in 40 minutes, or at the rate of twelve gallons per minute. This calculation was made for the first 40 minutes after the fire was applied, so that after the fire had been kept up some time longer, a few gallons more per minute might be allowed. We may then ask if, with the constant return of say 14 gallons of water, at a considerably reduced temperature by return pipes into the boiler every minute, and with as much of the hottest particles of the water leaving the boiler by the flow pipes per minute, it is wide by the mark to suppose the water in the boiler is kept below the boiling point.

With a powerful boiler and a small amount of pipe and hard firing, I can easily conceive how the water could boil; but such a foolish and dangerous combination of affairs should never occur. Mr A. is an advocate for a good amount of piping.

If some others of your experienced correspondents, as well as Mr A., would favour us with their views on this point, it might be interesting, and perhaps under their treatment bring out something useful.

AN OLD STOKER.

REMARKS ON THE BILBERGIA.

BY MR J. ANDERSON, GARDENER, MEADOWBANK, UDDINGSTONE.

THERE are many and diversified forms of the vegetable kingdom—many which have come within the province of the British cultivator—many which have contributed to adorn the horticultural world—many, too, which have been exultingly sent out, and destined on trial to be consigned for ever to oblivion; and many, we venture to predict, will yet appear, whether gathered from soil as yet unexplored by the unwearied exertions of our indefatigable botanists, or whether produced by the skilful manipulation of our own tribe at home, who,

in cases not a few, and in conformity with the rapid progression of the age we live in, have so changed the face of nature, that forms recognised to be beautiful a quarter of a century ago, are now torn up with as little compunction as the Groundsel, the Dandelion, or the Chickweed. We might instance the Pansy, the Dahlia, and the Hollyhock, as outdoor flowers. We might draw a favourable comparison with the Geranium, the Azalea, &c., as habitants of the greenhouse; the credit of which your readers do not require to be told belong to this generation, undoubtedly to many of themselves. But for the extension of the genera we are indebted to exotic aid, and as we are all interested in anything really good, I would beg respectfully to make honourable mention of the genus *Bilbergia*.

We certainly do not so often meet with this plant as its merits would lead us to demand, for though the flowers are short lived, I know no stove exotic so regularly ornamental, the colours of many of them so intensely vivid as to excite the admiration of all visitors. The plant has strong, succulent, serrated foliage, in many cases spiny, but at all times remarkable for its vigorous appearance.

They may be divided into two classes,—the upright and the pendulous flowering varieties. Among the former we have *B. splendida*, the finest of the genus. Their flowers are produced on a footstalk from 12 to 18 inches high, on globular heads, these heads equally divided into circular tiers, each tier only lasting one day in bloom; but the footstalk and bracts on it are also ornamental, and if a plant can be produced with five or six spikes of flowers at one time, I know nothing that would be more striking or more effective for a general display. *B. croyana* and *thryeoides* are both in this class, but neither of them so brilliant in colour as *B. splendida*, but nevertheless both are good.

Among the pendulous flowering varieties, we have *B. morelliana* and *vittata zonata*, both quite different in foliage and flower from the former varieties. The foliage of *B. morelliana* is light green, irregularly barred with downy white, and the foliage of *B. vittata zonata* is light brown, also irregularly barred with white. The flowers in this instance are blue, and are produced on a long, rather loose spike from the scarlet bracts of the flower stem, rendering an admirable contrast, and what adds considerably to their value, flowering in the dull months of winter.

They are very easily grown in strong heat and excessive moisture for evaporation, during the growing season; and if this is properly attended to, the water at the root must be all the more limited, as the rootlets are neither long nor plentiful in comparison to their foliage. Shallow pots will be found by far the best for growing them in, with a mixture of chopped peat and turfy matter, the whole incorporated with a goodly quantity of silver sand. They must also be preserved from the scorching rays of the summer's sun; by this

means their fine foliage will be preserved, which, independent of their elegant flowers, are at all times ornamental.

They are easily propagated by dividing the root, and will grow under the same treatment as the suckers of Pines which—minus the fruit—they very much resemble.

CUSTARD VEGETABLE MARROW.

BY MR D. THOMSON, DYRHAM PARK, HERTS.

THE Vegetable Marrow is much esteemed and called for by most families, especially in England. My object just now is to call attention to the above named kind, which I am inclined to think is very little grown, and that it only wants being once tried to prove its great superiority in every respect.

I have grown it exclusively for the last eight or ten years, and have introduced it to several other gardens, where its excellence has always been admitted. There is no other variety that ever I have met with that yields such heavy crops, as it invariably bears a fruit at every joint; and it is more delicious than the more common sorts. Its handsome shape renders it peculiarly pretty when dished—a point, trifling though it may appear, is not considered so at the tables of the wealthy.

I this spring sent some seeds to the Horticultural Society's Gardens at Chiswick, where it has been grown and tested along with a quantity of others, and has proved its superiority in all respects to any of them.

The Vegetable Marrow is much esteemed among amateurs and cottagers hereabouts, and I am quite sure that few vegetables, if any, will give a better return with the same labour, where a few barrow-fuls of decomposed dung or leaves can be afforded.

The mode which I adopt for its efficient and easy growth can be soon told, and may perhaps be of some service to your amateur or cottager readers, and may suggest a wrinkle to some who may be like myself, not over flush of labour. An open space about 12 feet wide is left down the centre of the Sea Kale brake. The Kale is forced on the ground by means of leaves. When the Kale is all cut, about the middle of April, a trench 4 feet wide and little more than 2 deep is opened in the centre piece of ground referred to, and into this trench are thrown the leaves that are no longer wanted for the Kale, and a covering of the mould to the depth of a foot on the top

of the leaves makes the place ready for the Marrows. The plants are planted about the last week of May under hand glasses, in a straight line down the centre of the ridge. On each side of the ridge I prick off such things as Curly Greens, Brussels Sprouts, &c., which are ready for planting out by the time the Marrows begin to spread, and the hand glasses are then removed. In some of the more unfavoured parts of Scotland probably they would not succeed well, except under glass, and I have no hesitation in saying that the "Custard" is worthy of such. It is quite as hardy as any of the others.

SHANKING OF GRAPES.

LAST December I offered a few words on this dreaded and destructive disease, and one object I had in doing so was to enlist the pens of others among your readers and correspondents to relate their views and experience, as well as to detail the circumstances under which shanking was observed to be most prevalent, with the various remedies applied for its cure, and the results of such remedies. I conceive that such testimony would be as near a way as any to unravel the difficulties which attend the subject. No doubt, there would be, as there always have been, conflicting opinions, but I think it would not be too much to expect that, if all the circumstances connected with the matter were minutely described, there would be a sufficient weight of evidence to point to a certain cause and then the chances of a certain cure would be more likely.

An unbroken silence remained up till your issue of last May, when "Cumbria" favoured us with nearly as many causes of shanking as there are days in the week; and you, Mr Editor, in an Editorial note, suggested some half-dozen points of enquiry, which, by some, were considered to smack more of the Editor's chair, than of the garden; and I have long ago forgiven your cruelty in handing them over to one whom you previously considered entirely lost in brakes of puzzlement.

At last I am delighted to find that your excellent correspondent, Mr Cramb, has brought his analytical mind to bear on the subject, and has given us his views in a concise and practical manner. The fact that Mr C.'s arguments all bear to one point, and that a point apparently established by his own experience, makes his authority all the more valuable. I read Mr C.'s papers with great interest, and all the more so because they are free of what he calls a "dogmatical standard," which is generally the offspring of narrow-mindedness. The instance of cure which he brings before us was particu-

larly interesting to me, not on account of its novelty, but from the fact that I had so operated last October on the Vines referred to at page 376 of your last year's volume, as having been planted in an ill drained border, lying below the ground level, on a subsoil of rank clay. A more inveterate case of shanking than these Vines were annually subject to, cannot well be imagined.

In the first week of last October I had their roots not partly lifted, but entirely disentangled from the borders, and every spadeful of the soil removed. A complete drainage, and an easy outlet for the water were secured, and the Vines were replanted in a sharp gritty soil. The deepest of the roots were not allowed to be more than a foot from the surface, and many of them were much nearer.

When the operation was complete, the border was protected from rains by wooden shutters up till the end of January, when I had a good covering of warm dung and leaves applied to the border, over which were again placed the shutters. By the middle of February I began forcing the Vines, which some observers considered rather daring under such circumstances. The buds swelled as freely as usual, and they "broke" and showed fruit as well as usual. But to cut a long story short, the Grapes were all cut by the middle of July, and, with the exception of a few berries in one very long bunch, which ought not to have been left at first, there was not a shanked berry in the house, and they coloured better than they ever did before.

In this case I can assign no other cure than the well-drained dry medium which had been afforded to the roots, for in all other respects the treatment was entirely the same as on former years. This instance corroborates Mr C.'s theory, and practice too; at the same time, my observation does not entirely corroborate that of Mr C.'s, as never having known of shanking where there was not an excessive accumulation of water at the root. I have other two borders equally well drained with the one now referred to, and where it is impossible for water to be in excess, while a great part of the borders are at the sametime above the ground level, and the Vines in both these have yearly had more or less of their Grapes shanked. The Grapes in one of these houses are just now colouring, and I can already detect a considerable extent of shanking, and I am quite certain the border has been what many would consider too dry this season, lying as it does above the ground, and sloping to the sun. The border is not deep, and it is so bottomed that the roots cannot penetrate the clay. However, I have determined to lift one-half of the Vines this autumn, and bring them all close to the surface in order further to test the remedy. Does not this disease prevail most on subsoils of clay, and is it not a rare occurrence on gravelly and chalky soils?

DHAIBHIDH.

SKETCH OF THE SWISS ALPINE FLORA, AND THE CULTURE OF ALPINE PLANTS.

By DR E. REGEL, Director of the Imperial Botanic Gardens at St Petersburg.

Translated in the *Gardeners' Chronicle* from the German by E. ORTGIES.*

How powerful is the attraction of mountain scenery to the inhabitant of low and flat countries! With what impatient delight the tourist visits the Swiss mountains; to repose there for a short while from the habitual occupation of everyday life—to breathe the pure and cooling mountain air, which is so wonderfully invigorating that we bear up easily against fatigues and hardships which, at a lower level, would soon overpower us—and to imprint the mind with that peculiar beauty and grandeur of scenery which furnish to memory a source of the most agreeable and impressive recollections!

Undoubtedly the principal charm of a mountainous country is above all to be found in the various formations and the gigantic proportions of the rock and mountains themselves; but here, as everywhere in landscape scenery, the vegetation exercises a most important influence on the character of the landscape. Lower down those fine forests, the fertile flowery meadows, and yonder abrupt towering walls of bare rock, or the swelling mountain slopes which border the valley; higher up the gradually decreasing number of species of trees and consequently a greater sameness in the character of the woodlands; those deep green Alp pastures, which in many parts of Switzerland give such a charming character to the country: take them away, would not the whole scenery have lost its chief attractions?

We ascend still higher, the large trees dwindle down to stunted bushes, the splendid Rose of the Alp (*Rhododendron hirsutum* and *R. ferrugineum*) cover with shining red flowers whole mountain slopes; in the short Grass at our feet flower the deep blue Gentians, the pretty red Primroses, the Bluebell-shaped Soldanella, the beautiful yellow and white kinds of Anemones, the sky blue Alpine Forget-me-not, the fine and interesting species of *Pedicularis*, &c. On the rocks and between detached masses of stones the

* The following communication is extracted from the excellent German horticultural periodical the *Gartenflora*, edited by Dr E. Regel. The editor is well known to the continental horticultural and botanical public as one of the ablest practical gardeners, and at the same time as one of those few men who combine in a rare degree the practical experience of the profession with a remarkable amount of botanical knowledge. In his situation as Curator of the Botanic Garden at Zurich (Switzerland), which situation he filled with the utmost zeal and the greatest success for 13 years, and which he only left in 1855 to accept the Directorship of the Imperial Botanic Gardens at St Petersburg, he had thus ample opportunities afforded to get intimately acquainted with the Alpine plants of the Swiss mountains, which he collected and transplanted himself, with the intention of surmounting by repeated experiments the difficulties which the cultivation of plants from the higher mountains generally offers—difficulties which cannot be entirely removed in all instances, but which may be avoided to a great extent by a rational treatment. If the Botanic Garden at Zurich can boast now of a very extensive collection of these interesting plants, it is entirely due to the indefatigable exertions of Dr Regel, who after he left Switzerland wrote the following article as a *resume* of his long experience in the treatment of Alpine plants. As his successor at Zurich, we feel desirous his great experience in this much neglected branch of plant culture should become more universally known, and we are happy to say the idea of communicating to English readers the results of Dr Regel's studies and labours occurred to us when visiting last summer in the company of our esteemed friend, D. Moore, Curator of the Glasnevin Gardens, Dublin. those same scenes which he so vividly depicts, and which attract every year many thousands of tourists of all nations, where the Alpine Flora reigns in all her glory amidst snow-clad mountains. Mr Moore not only applauded our idea but kindly promised his valuable assistance, and it is partly from his encouragement that we now submit the following translation to the indulgent notice of English readers.—*Note of the Translator.*

Saxifragas spread their swelling cushions of vivid green, and *Primulas*, blue *Phyteumas*, *Globularias* and many others find in the smallest fissures of the rock a comfortable abode. Yet higher up leads our path, if path there is; the vegetation becomes more and more stunted and scantier as we go on, by our side and above us large tracts are covered with extensive snowfields, never soiled by the footsteps of man; the mountain tops, their bold outlines often broken by deep indentures, stand out against a clear cloudless sky, and the broad glacier rolls his waves like a mighty river cascade suddenly frozen over rocks and mountain slopes far down to the valley. The icy breeze from the frozen ocean of the high Alpine region makes us shiver with cold even in the hottest days of summer, and yet wherever the snow has melted away, or often even piercing the icy cover, we meet the tiny inhabitants of these inhospitable regions spreading a flowery mantle over the ground, where a few short days before the winter still held its sway. The pretty *Ranunculus alpes ris* and *glacialis*, *Geum reptans*, the *Soldanellas*, and different kinds of *Saxifragas* are here at home, and give us a kind welcome amidst dark blocks of the naked rock, dazzling white fields of snow and the deeper coloured masses of ice, with their fantastical horns and deep fissures.

We venture to climb still higher, over snowfields and glaciers; we make a path with cautious steps, not afraid at the thought that a single false step might make us slip and perish, for often we are forced to find a path on the very brink of threatening precipices; over yonder on that sunny slope, a spot free from snow, a rocky island in a frozen ocean, where on blocks and amongst loose masses of shattered stones pretty *Saxifragas*, the Moss-like *Cherleria*, small but beautiful *Gentianas* and *Phyteumas* grow, where the *Aretia helvetica* forms small cushions, and where the *Aretia glacialis* with rosy and white conspicuous flowers grows in society with the azure blue *Eritrichium nanum*, two rare gems in the wreath with which the Alps adorn the goddess Flora.* And a beautiful spot it is, inviting to rest from our fatiguing ascent!—on all sides surrounded by frowning rocks and glittering snow, by stern Nature in her grandest aspect. All around us reigns deep winter and dead silence, only at intervals broken by the thundering noise of an avalanche, sweeping down from the mountain peaks, which tower still far above our heads.

If we feel humiliated by the impression of our own pigmy nature, so crushed by the overpowering grandeur of the surrounding scenery, the reviving sunshine and the smiling flower tell us a tale of a great but kind Providence, which seems to pervade the whole wonderful scene, and finds also an entrance to our hearts.

This is but a slightly sketched picture, adorned only with the most familiar forms of Alpine plants, which we have offered in the above as an introduction to our subject. How is it—this question has certainly been repeated by many a tourist returning from scenes such as we left just now—that we collect with great care and still greater expense plants from all quarters of the globe, and neglect and overlook the treasures of our own Alpine Flora? Or if they are indeed cultivated in a few places, that so few of them serve to decorate our gardens?—the greatest number being grown in small pots,

* The two last mentioned species are probably the most beautiful plants which grow on the Alps, especially the latter. The botanist who has for the first time visited the higher Scottish mountains, will readily recollect to mind the delight it gave him to look on the charming flowers of *Myosotis alpestris*, and thus be enabled to form a good idea of the *Eritrichium nanum*, as it occurs on the Alps.

This gem of the Alpine Flora is only found at great elevations, which in no considerable degree adds a charm to its loveliness, because the upper dreary zone of vegetation, which consists chiefly of Cyperaceous and Gramineous plants, must be passed over before the *Eritrichium* is reached, whose large deep azure blue flowers suddenly bursting on view, in elegant little masses, on the faces of rocks bare of earth and only a few feet lower than the pure white snow, produces an irresistible effect on the weary traveller, and add a peculiar charm to the landscape. At least such were the circumstances under which we saw this plant.—D. M.

where they seem to us as strangers from distant countries, hardly recalling the days that we met them in their mountain homes.

We have asked this question ourselves many a time, and have tried to cultivate Alpine plants in the open ground on a larger scale, profiting by our experience as we went on, so that we obtained at last a sure base, though we did not succeed in all instances. But before we enter on the discussion of special culture, we may be permitted to throw a cursory glance on the climatic and local differences which affect the natural localities of Alpine plants.

1. *Difference of Climate.*—The climate is the principal cause of the difficulties which we encounter in cultivating plants growing exclusively on high mountains, or in the Arctic regions of our globe. We can never succeed even approximately in giving them the short summer, the cool temperature, the rarified air, the full sunlight, the deep covering of snow during the long winter, to all of which they are accustomed in their native habits. The experiments we made in the Botanic Garden at Zurich, under a climate where the Grape ripens well, and where far greater difficulties had to be encountered than gardeners would have to contend with in the central and northern parts of Germany, or under the climate of St Petersburg, where we intend to continue our experiments. Notwithstanding we have often heard the observation from visitors admiring the luxuriant appearance of many Alpine plants in our out-of-door collections, that the climate of Zurich from its vicinity to high mountains would facilitate their culture; but in reality Zurich has only the disadvantages of such a vicinity, such as sudden changes of temperature, late frosts in spring and early frosts in fall, combined with a hotter summer than is experienced in Germany, and these are just the very things unfavourable to the cultivation of Alpine plants.

In ascending from the valley to the mountains we find a similar change of climate as if we were advancing from the equator towards the poles, which produces a marked effect on vegetation. For example, many of our Swiss mountain plants occur in the lowlands and swamps of northern Germany, such as *Gentiana verna*, *Primula farinosa*, *Pinguicula vulgaris*, *Linnæa borealis*, &c., which would lead us to suppose that the climate there must be more favourable for cultivating Alpine plants at Zurich.

Professor Heer, well known to the scientific world by his splendid work on the Tertiary Flora of Switzerland, had, long before he began this most difficult study, made himself well acquainted with the phanerogamous portion of the Swiss Flora. He wrote, with Hegetschweiler, the best Swiss Flora we possess. In this valuable work he divides Switzerland, according to climate, into the following five regions.*

1. The *montane region*, comprising that part of the country which lies at an elevation of 3000 to 4400 feet above the sea level. This region has a climate analogous to Germany, and most of the plants indigenous to it, as well as many others which belong properly to higher stations, but which descend and flourish at this elevation, can be grown without difficulty in our gardens. Here the winter lasts about six months, from November till May.

2. The *sub-Alpine region* reaches from 4400 to 5500 feet elevation. In sunny places and on steep slopes, where the snow sooner melts away, the soil remains free from snow from the end of May till October, but in the shady or flat localities only from the middle or end of June till October.

3. The *Alpine region* is considered to lie between 5500 to 7000 feet of supra-marine elevation. In sunny localities and on declivities, the snow dis-

* This division is founded on observations mostly made in the northern parts of Switzerland; the Southern Alps bordering on Italy have somewhat higher limits for each region which are also affected by unusually hot and dry summers, such as the last (1856) has been, when the snows melt away sooner and higher up. Last summer was, therefore, specially favourable for excursions to the highest mountains. The oldest men here did not remember to have seen the mountains more free from snow than they were last season.—*Note of the Translator.*

appears from the end of June to October, but on shady places or level plains, especially towards the upper limits, the snow remains all the year round.

4. The *subnivale* region extends from 7000 to 8500 feet. The soil is covered with eternal snow, except in places exposed to the full sun and on declivities, where the soil appears from the middle or end of July till the middle of September.

5. The *nivale* region covers the highest mountain tops from 8500 feet upwards; and it is only in the month of August that a few steep and sunny places are ever free from snow.

In looking back on these divisions we have in the same proportion as we ascend a decreasing temperature, a shorter summer, a longer continuing snow cover, and lastly, a temperature of the soil comparatively higher compared with the ambient air.

This latter circumstance is the cause that the leaves and stems of plants from the highest regions remain very short and dwarf, though the flowers are perfectly developed, and generally large in proportion to the rest of the plant, the short season of vegetation contributing chiefly to their development. Shrubby plants, such as the Alpine species of Willows, *Arbutus alpina*, *Azalea procumbens*, &c., seek the terrestrial warmth, and creep close along the ground. Plants of these regions which have been grown in gardens become there more luxuriant in foliage, but produce fewer flowers. The *Silene acaulis*, for example, belongs to the Alpine plants which ascend to the highest regions; the higher the station we meet this lovely plant, the dwarfer and more compact its growth, and the more abundantly and the deeper coloured its red flowers, so that in such places it is frequently quite concealed by one sheet of bloom. Cultivated in the garden the plant gets much larger, but the flowers are less numerous and of a pale reddish hue. Plants from the montane region, such as many Grasses, *Phleum alpinum*, *Poa alpina*, &c., which ascend to the Alpine and subnivale regions, get there quite dwarf, but when transplanted into the gardens, they soon regain their usual size, or even exceed it.

Those who collect Alpine plants for cultivation ought to take care, therefore, not only to dig them out with a good ball of the soil around the roots, but before they replant them to clean them of all the other plants taken up at the same time, especially of the Grasses and Carices, for these would soon begin to grow luxuriantly and choke the delicate and small real Alpine plants, which always remain dwarf. The low creeping Alpine shrubs, *Salix retusa*, *reticulata*, *serpyllifolia*, and others, get much more luxuriant in gardens, where they form long and thick woody stems, but their manner of growth remains the same; they always continue to creep along the ground, or their slender branches hang gracefully down over artificial rockwork; but I never observed on such plants branches which showed a tendency to grow erect. Their vegetative character is entirely different from that of the Mountain Pine (*Pinus pumilio*) which in high regions also creep along the ground, whilst lower down it grows to erect and tall trees. We make, therefore, a difference between those polymorphous plants which ascend from the flat country to considerable heights, and which assume there, under the influence of very different climatic and local conditions, quite another habit, becoming what we call Alpine forms, and those plants which seem exclusively formed for considerable altitudes, and which in consequence soon perish when subjected to the usual treatment of garden plants.

Generally speaking it is my conviction that it is less the heat of our summers than their long duration which renders the culture of Alpine plants so difficult; for these plants, destined by nature to complete their vegetation in a few weeks, and to repose 9 or 10 months under a deep snow cover, die from exhaustion and want of rest. With the first genial beam of spring the Alpine plants begin to flower in gardens, and by the beginning of summer they have

already ripened their seeds, and should now, as in their native homes, go to rest; but the hottest period of the year only now begins, and afterwards follow the long autumn months, which prolong their growing season two or three times longer than is beneficial to their constitution.

FUCHSIAS.

The gardener who is fortunate enough to have a bed or two of Fuchsias in perfection during the present month will be an object of envy to his less fortunate neighbours. For elegance of forms, richness and variety of colours, and permanence of bloom, nothing which is grown can beat such a collection. Even the old varieties, the *Coccinea* and *Virgata*, form beautiful beds or single plants; but they cannot compete with the varieties since introduced and raised from hybridised seed by florists. A long list of these, professing to have some novel attractions, is presented to the floral world every year; and there are, no doubt, some good sorts annually added to the former stock. Now is the time for the amateur to make his selection from full-grown specimens in a good garden—a plan far superior to that of ordering new sorts on the faith of the descriptions of florists' lists. Besides the colours of the blooms, we have to consider the mode of growth, whether upright or trailing, the character of the foliage, and the persistency of the habit of flowering. By observing these properties in the gardens of others, we may proceed to choose for ourselves without those chances of disappointment which will otherwise be sure to occur.

But when we have selected good sorts, we must not think a fine bed is secured by merely planting our purchases. From the experience of several years we can assure our readers that tender plants of Fuchsias, as of other things, trained for sale by the nurseryman, seldom exhibit themselves to advantage the first year. A pretty bed may indeed be expected, if the young plants are well attended to; but a full and robust growth can only be attained from roots more compact and vigorous. Supposing, then, you have a dozen good varieties of Fuchsias, they must be taken up in the autumn before frost injures the stems, potted, and kept in the greenhouse, but without the least stimulus, so as to allow the stems to become bare of leaves. By shortening the stems and regulating the buds as they begin to push in the spring, fine heads of new wood may be formed; and when plants so trained are put out in May, they seldom fail to reward the grower by their vigour of foliage and abundance of bloom.

This is one method. But we doubt whether it is so good a one as the following. The old varieties, which are found to be hardy in our gardens, are cut down to the ground from year to year; and yet they make such rapid and vigorous growth, that we have now some bushes six feet high, covered from top to bottom with bloom. Moreover, on looking over all our Fuchsias, both bedded and potted, we find the best specimens are those of which none of last year's wood remains, but which were cut quite down in the autumn. Such plants produce the new shoots with great vigour, and their growth is more regular, and more easily regulated, than that of the old-wooded sorts. We would, therefore, recommend that both methods should be adopted—that of cutting down close for the kinds to be grown in beds, that of leaving the old wood for those destined to bloom in pots. Flowers may be got very early in the greenhouse by the latter plan, much sooner than would be the case if new stems were depended on.

The training of Fuchsias is a rather troublesome affair. Some kinds have a strong tendency to lateral growth, and even to a drooping dependent habit, and, unless this is early corrected, they will not look well in beds. The object, in such cases, must be to gain two or three upright shoots by cutting away all laterals; and then, by tying these shoots to neat stakes, a pretty drooping head will be the result. But we much prefer the more perpendicular

growing varieties for beds; while the droopers do most admirably for pot culture. If allowed to take their own course, some of these will cover their pots, and make beautiful objects when placed in wire or wicker stands, or suspended in baskets. If, in making a bed, the taller kinds are put in the centre, and attention is given to the arrangement of the colours, there cannot be a more lovely object in the summer and autumn garden. As the plants advance, judicious training should be given them, and all seed vessels removed as they appear. A bed of Fuchsias will require to be looked over at least once a-week, if order and neatness are to give their additional charm to the natural beauties of the plants.

Cuttings, if taken off now, and put into a gentle heat, or even without artificial warmth, will make nice plants by next spring. Another method is to put strong shoots deeply into the ground against a wall with a southern aspect, in October or November, and these will be ready to remove, rooted, in the following spring. The soil for Fuchsias should be a good loam, with some rotten dung and leaf-mould well incorporated with it; but, in growing them in pots preparatory to the blooming season, as little excitement as possible should be used, and the whole process be assimilated as much as possible to out-door culture. A collection of Fuchsias grown well in pots may be used with admirable effect, during the summer months, to beautify the garden. The pots may be placed in vacant spaces, or in positions which will readily catch the eye; and, as they may be removed as occasion requires, they will be found to answer many valuable ends. We have about twenty large specimens now upon a bank, the back of which is thick with Evergreens, and the effect is very striking, and attracts the eye of all visitors before anything else.—*The Field*.

CULTIVATION OF THE PEACH IN AMERICA.—In some districts, the Peach is grown for the feeding of pigs. It is stated that the pigs, when confined to the orchards, acquire a delicacy of taste quite marvellous. They will not eat Peaches which have lain for four or five days, selecting with the greatest nicety those which have recently dropped. They will fast for days, rather than partake of the fallen Peach. They anticipate winds, and calculate upon the result, waiting for a windfall. In Mr Russell's *America*, there are notices of Peach orchards, but not such as are appropriated to the pig.—“Towards Lake Ontario, which is six miles north of the town, the soil is of a light sand, not approaching by any means to what would be called a loam in England. This kind of land forms a belt extending along the lake for some distance, and is well adapted to the Peach; indeed it is said this tree grows here as well as in any part of America. In going through some of the orchards I was surprised at the crops which trees only eight years old were bearing. They were standards, and every branch was literally bent towards the ground with its load of ripe Peaches. The best Peaches, of a delicious flavour were selling at four shillings a bushel, while secondary kinds might be had for half this sum. About 120,000 bushels would be gathered this year in a narrow strip along the banks of the river. An orchard of 25 acres would realise the sum of £400, which appears rather small, inasmuch as the same extent of land in potatoes would yield more, for they were selling at a dollar a bushel. A Peach orchard requires more attention than an Apple orchard, as the ground is usually cultivated by the plough between the rows of trees. The ground, too, becomes sooner exhausted by, or unfitted for, the growth of Peaches than of Apples. It is a lovely and novel sight to one from the old country to see a productive Peach orchard when the fruit is ripe.—*Russell's America*.

APPLE ORCHARDS IN AMERICA.—*St Hilaire*.—In ascending the flank of the hill, fine orchards of Apple trees were once more observed on the poor granitic gravels, and many of the trees were loaded with fruit. The apple does not thrive on the clay soils of the flats of the St Lawrence, in consequence, I

suppose, of their tenacious nature, while good orchards are met with throughout the island of Montreal, where the soil rests upon the limestone and is more friable. *Montreal*.—The Apple orchards are numerous, and relieve the country of the monotonous aspect which prevails in the flats of the St Lawrence, where scarcely a tree is to be seen. *The President's Residence*.—The rounded hillocks to the north of Cincinnati afford picturesque spots for residences, and many elegant villas and substantial mansions crown these heights. Among others, Mr Buchanan's may be mentioned as laid out with great taste. Fine orchards of Apples occupied the eastern and western slopes of a lengthened ridge running out towards the Ohio, while the vineyard covered the rounded bank in front, and the elegant mansion overlooked the whole. The Apples were fine and particularly large; some of the varieties ripened in June, while others were not yet ready to be gathered. This good clay loam bore the best Grass that I had seen in America, with the exception of the Genesee flats.—*Ibid*.

CULTIVATION OF THE VINE AT CINCINNATI.—I visited Mr Longworth's wine vaults, which have become one of the sights of the town. Great credit is due to this gentleman for his perseverance in introducing and promoting the cultivation of the native Grape for the making of wine, which is now beginning to compete with the wines of Europe. As I by no means pretend to be a connoisseur, I cannot say how far the sparkling Catawba falls short of good Champagne. To my taste it seemed to retain a little of the peculiar flavour which predominates to a disagreeable extent in the wild Grape that is so abundant in the woods. The vineyards occupy the southern slopes of the rounded hills on the banks of the river. The soil is a tenacious loam, and is usually trenched two feet before the Vines are planted. It only contains a moderate quantity of vegetable mould, which is said to be more abundant on the northern exposures of the hills than on the southern, in consequence of the accumulation being greater where the soil is less directly exposed to the action of the sun's rays. It was reckoned that there were 1500 acres in Ohio exclusively devoted to Grape growing in 1853, of which 300 to 400 acres are in the vicinity of Cincinnati. On the Kentucky side a considerable quantity of land is likewise devoted to the Grape, and its culture is also extending along the banks of the rivers in Illinois, Indiana, and Missouri. Some of the vineyards yield from 7000 to 8000 gallons. The culture of the Grape, however, rarely furnishes a profitable investment for capital, if hired labour is wholly employed. The German settlers realise a good income from this source, as their families all assist. A piece of land from fifteen to twenty acres, with a house on it, is given to a German family, on condition that they plant a certain quantity of Grapes every year, and pay the proprietor one half of the proceeds of the vineyard.—*Ibid*.

GEORGE STEPHENSON A GARDENER.—He also devoted much of his time at Tipton to horticultural pursuits, and carried on farming operations with considerable success. He lived the life of a country gentlemen of ample means—feeding stock, experimenting in manure, and attending the agricultural meetings of his neighbourhood. When he took part in their discussions, he brought the same practical and vigorous mind to bear upon the various questions of tillage, drainage, and farm economy, which he had formerly done in mechanical and engineering matters. At one of the meetings of the North Derbyshire Agricultural Society he favoured the assembled farmers with an explanation of his theory of vegetation. The practical conclusion to which it led him was, that the agriculturist ought to give as much light and heat to the soil as possible. At the same time he stated his opinion, that in some cold soils water contributed to promote vegetation, rather than to impede it as was generally believed; for the water, being exposed to the sun and atmosphere, became specifically warmer than the earth it covered, and when it afterwards irrigated the fields it conveyed this additional heat to the soil which it permeated. But his chief delight was

in his pineries, greenhouses, and melon-frames; and he was now as eager to excel all other growers of fruits and vegetables in the neighbourhood as he had been to surpass the villagers of Killingworth in the production of gigantic Leeks and Cabbages, thirty years before. At one agricultural meeting he stated that he intended yet to grow Pine-apples at Tapton as big as Pumpkins. The only man in the county to whom he would "knock under" was his friend Paxton, and he was so old in the service and so skilful that he could scarcely hope to beat him. He took much pride in his growth of Cucumbers. He raised them very fine and large, but he could not make them grow straight. Place them as he would, notwithstanding all his propping of them, and humouring them by modifying the application of heat and the admission of light for the purpose of effecting his object, they would still insist on growing crooked in their own way. At last he had a number of glass cylinders made, into which the growing Cucumbers were inserted, and then he succeeded in growing them perfectly straight. Carrying one of the new products into his house one day, and exhibiting it to a party of visitors, he told them of the expedient he had adopted, and added gleefully, "I think I have bothered them noo!"—*Smiles' Life of George Stephenson*.

THE GUANABANA.—THE CHIRIMOYA.—I saw some trees rather taller and more slender than Apple trees. I thought at first they were deformed by dozens of hornet's nests. I looked again, and really the supposed nests were the fruit. It was the Guanabana (*Anona muricata*), called in Jamaica *suor sop*. The flesh is firm, slightly fibrous, so as to eat beautifully with a fork. Elegance of eating is a high recommendation to a fruit. However delicious the flavour, you cannot enjoy a fruit that smears fingers and face, clogs the teeth, or keeps you on the alert to separate eatable from uneatable. The Guanabana is as large as the largest Pine-apple, slightly acid, and not quite sweet enough, and with no aromatic flavour. Two other Anonas are to be mentioned. The *A. Chirimolia*, the Chirimoya, is smaller, of less regular shape, more fragile rind and less pulp, than the Guanabana. It is by many reckoned the best fruit in the world, and by others rejected in disgust. Its flavour is almost exactly that of its congener of the Valley of the Mississippi, the Anona or Asimina triloba, there called papaw. The *Anona Squamosa* is of the size of a large Apple, much like the Chirimoya in physical constitution, but inferior in flavour. They call it *anon*. The Guanabana, which I prefer, is undervalued here, just as our northern papaw is abandoned to negroes and opossums.—*Prof. Horton's New Grenada*.

MESSRS A. PAUL & SON'S NURSERIES, CHESHUNT, HERTS.

These well known nursery grounds are 13 miles north-east of London, and one mile from the Cheshunt Station on the Eastern Counties Railway. Although the principal stock consists of Roses, Hollyhocks, Coniferæ, ornamental trees and shrubs, and fruit trees, there is a variety of other things usually found in suburban nurseries. A broad walk leads from the high road through the centre of the grounds; on either hand are quantities of bedding plants arranged in masses, behind which is a considerable collection of herbaceous plants chiefly plunged in pots under the shade and shelter of a north wall. Passing numerous glass houses and ranges of cold pits, we first encounter several squares of hardy Heaths, Rhododendrons, Azaleas, and other American plants. Here also is a "conservative" wall with a west aspect, against which are placed various plants reputed hardy, but which are found unsuitable for an open situation in the climate of Hertfordshire. The most interesting of these were:—*Escallonia macrantha*, *Garrya macrophylla*, Silver and Gold-edged *Alaternus*, the Banksia *Solfaterre* and Cloth of Gold Roses, the Gum *Cistus*, *Aristolochia Kæmpferi*, *Stauntonia latifolia*, *Buddlea globosa*, *Ceanothus azureus*, *C. dentatus* and *C. rigidus*, *Eriobotrya*

japonica, *Azara crassifolia*, *Elaeagnus reflexus*, *Hedera algeriensis*, the variegated *Euenymus*, and a few others. We also saw several beds of climbing plants plunged in pots to be ready for removal at any season, such as *Clematis*, *Honeysuckles*, *Ivies*, &c. Passing to the Arboretum we found a variety of beautiful and healthy young Conifers interspersed with trees of pendulous growth, and some with variegated leaves; while climbing plants trained up pillars and various flowering shrubs agreeably diversified this part of the grounds, and offered a favourable opportunity to the purchaser for selection. Among the Conifers were *Abies Deodara*, 25 feet; *Pinus excelsa*, 15 feet; *Picea nobilis*, 7 feet; *Picea Pinsapo*, 14 feet; *Cryptomeria japonica* and *Taxodium sempervirens*, each 15 feet; *Pinus Benthamiana*, 6 feet; *Abies excelsa monstrosa* (a curious weeping kind of Fir), 10 feet; *Abies alba glauca* (a very silvery variety) 7 feet; *Picea Nordmanniana*, 7 feet; *Cupressus Lambertiana*, 18 feet; *Juniperus chinensis*, 14 feet; *Salisburia adiantifolia*, 15 feet; and handsome bushes of many *Pinuses*, *Yews*, *Junipers*, and *Cypresses* of less dimensions. Among flowering shrubs the most remarkable were *Indigofera Dosua*, a charming shrub covered with spikes of purplish rose-coloured flowers, which are produced abundantly and for a long period; the *Ceanothus pallidus*, grown as a bush, is similar in style of growth and little inferior in point of beauty; and both these plants are found perfectly hardy. Then there were good examples of *Garry elliptica*, *Spiraea callosa*, *S. californica*, *S. arizæfolia*, *Hydrangea radiata*, *Magnolias*, *Ligustrums*, *Arbutuses*, *Berberis*, &c. The effect of sundry climbing plants, introduced among the evergreens and trained up rustic poles, was very good. Of those now in flower may be mentioned *Lonicera hybrida nova* (an abundant and rich flowered kind), *L. flava nova* (the Yellow Trumpet Honeysuckle), *Clematis florida*, *C. Sieboldi*, *C. Hendersoni*, *C. viticella* (three kinds), *C. odorata azurea* (a bright purple sweet-scented sort, somewhat in the way of *C. flammula*), and *Tecoma flava speciosa*. Of climbers rich in foliage the most remarkable were some species of *Vines*, *Tecomas*, *Atragenes*, and *Ivies*.

Quitting the Arboretum we passed to the Hollyhocks, where a gorgeous spectacle presented itself. There is about two acres covered with these plants in flower, the spikes in many instances rising to the height of 10 feet. Among the most beautiful may be reckoned *Beauty of Cheshunt*, light rosy red; *Eugenie*, saffron shaded with pink; *Honourable Mrs Ashley*, lilac peach; *Attraction (Paul)*, cherry colour beautiful on the spike; *Lemonade*, improved canary purple base; *Crusader*, rich even rose; *Leonice*, crimson scarlet; *Celestial*, delicate blush, the colour of the *Celestial Rose*; *Memnon*, light crimson, very fine; *Miss Ashley*, pale creamy fawn; *Mrs Oakes*, delicate shaded salmon, very close; *Pourpre de Tyre*, rich smooth purple; *Lady Willoughby d'Eresby (Paul)*, pale cream, remarkably smooth and very beautiful on the spike; *Waterloo*, rich blood red; *El Dorado*, deep golden yellow; *Primrose Perfection*, delicate primrose; *Purple Perfection*, light purple; *Queen of the Whites*, snowy white; *Rosy Morn*, bright rose; *Queen of the Yellows*, yellow, very smooth and close; *Lady Palmerston*, shaded peach, of a soft and distinct colour; *White Globe*, white forming a long close spike; *Sir Colin Campbell*, bright cherry scarlet, showy and good; *Lady Franklin*, bright pink, very smooth and good substance. These are all named varieties, and among the seedlings there are many very promising yearlings. On our way from the Hollyhocks to the *Roses* we passed several squares of choice Conifers and other evergreens arranged in their respective sorts and sizes, which appear to have suffered nothing from the continued dry weather owing, probably, to deep cultivation. A border of miscellaneous evergreens contrasted well with these; at the back are numerous *Deodar* and *Douglas Firs*, *Cedar of Lebanon*, &c., 8 to 10 feet in height, the front rows gradually receding to the walk, and well intermixed with various evergreens.

On entering the *Rose grounds* there is still no lack of flowers, and although

these are at present somewhat small in size, the promise of autumn bloom is both good and abundant. The Tea-scented Roses, judging from the flower stalks, must have been one mass of beauty; some, indeed, were everything that could be wished for now; Sombreuil, Comte de Paris, Gloire de Dijon, Vicomtesse Decazes, Safranot, and Narcisse were the most beautiful; perpetual Moss Salet and Madame Edouard Ory were also flowering freely and well. Among other kinds we found—Hybrid Perpetuals: Triomphe de l'Exposition, purplish crimson; Triomphe de Paris, dark crimson; Souvenir de Reine d'Angleterre, bright rose; Ornement des Jardins, brilliant red; Bacchus, crimson scarlet, a most profuse bloomer; Madame Vidot, transparent flesh; Louise Odier, bright rose; Louis Peyronny, silvery rose; Jules Margottin, bright cherry; Lord Raglan, scarlet crimson; General Jacqueminot, brilliant velvety red; Auguste Mie, light pink; Ravel, bright scarlet crimson; Madame Therese Appert, pale rose; Gustave Coraux, purple; Geant des Batailles, bright crimson; Bourbons: Leon Oursel, rosy pink; Scipio, brilliant crimson; Angelina Bucelle, rosy purple; Madame Angelina, fawn; Dr Leprestre, purplish red; Souvenir de Malmaison, flesh; Sir Joseph Paxton, bright rose shaded; Prince Albert, scarlet crimson, a most abundant bloomer; and Marquis Balbiano, rose tinged with silver.

Crossing the New River we entered the fruit ground, about 20 acres in extent, the most remarkable feature of which is an avenue of pyramidal trees, 150 yards long, many of the Pear trees in a fruit-bearing state. In this avenue is planted one of a sort of old and new kinds, in order to test their accuracy and merit before propagating for sale. On either side of this avenue are the usual nursery squares, occupied with the trees growing for sale. This branch of the nursery is alternately cropped with fruit and ornamental trees. —*Gardeners' Chronicle.*

FRUITS AND FLOWERS IN NEW GRENADA.

THE GRANADILLA.—Another *Passiflora*, probably *P. ligularis*, yields the Granadilla, one of the very best fruits unknown to the New York market. The walls of the fruit are thin, and, when broken open, are clear and dry; and the mechanical process of taking out the rich, juicy, sweet arils with a fork or spoon is in itself a very agreeable one. The Granadilla and all the Taxonias are plants of highlands, and only the badea and the Cauca curuba grow in Tierra Caliente. All are Vines that will flower in our green-houses, but all cast their fruit there. Query: Would not *P. quadrangularis* perfect its fruit if kept at a temperature below 70?

PASSION-FLOWERS.—TACKSONIA.—Soon I caught at a passion-flower that was not a passion-flower, for it had assumed a form so distorted as to take the name of Tacksonia. This new *Passiflorate* genus has numerous species here, several of which yield a fruit known at Bogota as curuba. Some of them are very fine when well sweetened. The seed is swallowed with the aril, which is the only edible part. The curuba of the Cauca is a real *Passiflora*, which, if not a variety of the *P. quadrangularis* known in our green-houses, and here called the badea, is certainly close to it. Both are huge fruits, as large as a small Water-Melon; but of the badea you eat the walls of the fruit itself as well as the arils, while of the curuba, as of that of Bogota, only the aril serves. The utter neglect of cultivation of fruits gives rise to all my doubts as to these being varieties, and what adds to my difficulty is, that I have never been able to obtain a ripe bada. . . . A few words more will finish all I have to say of the *Passiflorate* plants of this country. Several have very small fruits and flowers. One, with a large pretty flower, has a tolerable fruit, with a very hard shell. Another, with a viscid calyx, has a fruit so thin that it is called paper granadillo—granadillo de papel. I found one *Passiflora* that was an erect bush, and another still was a tree! It was so high that I had to stand on my horse's back to reach the lowest limbs.

BATS—THE POMAROSA—THE MANGO.—I have said that gardens are unknown in New Grenada. At the Chocho are three, all with high walls, and padlocks on the gates. Without these, fruit can not be cultivated. The gardens contain nothing but perennials, chiefly trees, for monocarpous plants can not be kept up where all labour is spasmodic. As all other mammals are kept out by hedge, gate, and padlock, the most formidable foe that invades the premises is the bat. They come in myriads of myriads, and, of course, in the night. Human weapons are as powerless against them as against locusts. The *pomarosa* is their first choice. It is a Myrtate fruit, perhaps *Eugenia Jambo*, of the size of a small Peach, and with a slight flavour of wintergreen. Between bats and children I never expect to see a ripe one. In default of this they even attack the Mango—*Mangifera Indica*. This fruit, of the shape and size of a Pear, but with the large end attached to the stem, is a decided favourite in the tropics, though I can not forget how it has been described as a mixture of tow and turpentine. You must learn to overlook these two ingredients, which are never entirely absent, but not always prominent.

THE PINUELA.—I came to another plant with stiff, thorny leaves, much like those of the century plant. The inner leaves were red, and within is a dense head of flowers six inches in diameter, which give place to scores of fruits as large as a finger. It bears the name of Pinuela, and is one of the best fruits of the land, being among the sweetest in the world, with a good supply of a very agreeable acid. The drawbacks are that each fruit must be peeled—and the operation covers the fingers with sirup—and that there is rather an abundance of seeds. These are said to have been the original carat weights, and the plant is the *Bromelia Karatas*. It makes a formidable hedge, and it often costs more to cut your way with a long machete to the centre of a vigorous plant, than all the fruits are worth. I have seen where boys have cut a sort of dog-hole to creep in, six or eight feet under the leaves, and it seemed to me an operation worthy of Baron Trenck. There is another species or variety, I know not which, that is so acrid as to blister the lips.

PHLOXES.

Of late years these have been making rapid progress in the march of improvement, and although nearly all the varieties of this beautiful genus will grow freely in almost any garden soil, still they are seldom found in first class condition. As Messrs Downie & Laird of Edinburgh have been most successful not only in raising fine varieties of this flower from seed, but also in flowering them in perfection, we beg to lay before our readers the mode of culture adopted by them, which is as follows:—

In the first place they select a sheltered, but at the same time an open situation for them, having a rich loam, not over sandy, at least $1\frac{1}{2}$ to 2 feet deep. This they will trench over in autumn in a rough manner, avoiding at the same time heavy manuring, more especially leaf-mould or decayed vegetable matter; this last generates insects, which eat the young plants. If the ground has been well manured for any previous crop it is much safer to plant out without manure, and rather depend upon giving the plant some in a liquid state once or twice a week, just before they are coming into bloom. Nothing answers better for this purpose than sheep's droppings; applications of this kind both add to the size of the spike and impart to the foliage a dark shining green. Great caution is enjoined on this point, as it is stated that many fine collections have been lost by injudicious manuring. Also avoid if possible planting on a steep or sloping piece of ground, as few plants suffer so soon for want of water as the Phlox. In dry weather the beds should receive a good watering at least once a week. Should this be neglected the plants will come both weakly and prematurely into bloom, and have a very unsightly appearance, and, as young plants produce much finer spikes than

old ones, cuttings should be struck the summer before they are wanted under a hand-glass, and potted off as soon as struck (which will generally be in about four weeks), and kept in pots in a cold frame over winter. Towards the end of March, if the weather is favourable, plant out in rows 2 feet apart in the row, and 3 feet asunder according to circumstances. To procure a succession of bloom, take the strongest cuttings from the old stools, when they are about 3 inches long; use 5-inch pots, putting one cutting into each pot; place them on a gentle hotbed, and when well rooted and hardened off, they may either be planted out or re-potted in 8-inch pots, plunged out in any sheltered situation, and taken into the greenhouse when they begin to show bloom. These will be found useful if wanted for exhibition about the end of August or beginning of September. To grow Phloxes in perfection they should be renewed from cuttings at least every three years, and, if wanted for exhibition, two or three stems may be left on an old, and one only on a young plant. Have them well secured to stakes and protected from rain, and, if possible, from scorching sunshine.

About the middle of March a selection should be made from plants struck the previous season, taking care to choose those that are throwing up vigorous shoots. Put one plant in each pot, allowing not more than two stems to each, using pots from 8 to 12 inches in diameter, according to the strength of the plants, avoiding too much drainage. Pot with rich fibry loam, adding a little sand and well decomposed manure. The dwarfier growing sorts may be placed under glass at once, either in a cold frame or greenhouse, and kept as near the glass as convenient. The dwarfier they can be grown the better. Give air on all possible opportunities. A little weak liquid manure may be given with advantage occasionally. The tall growing varieties may be plunged out of doors in any sheltered situation, and brought into the conservatory or greenhouse. If they have long naked stems the pots can be placed out of sight, so as to make the heads of bloom display themselves above other plants. By a careful selection, and only bringing the plants in-doors as they show flower, a succession of bloom may be kept up from June till September. When quantities of them are grown as just described, they produce a beautiful display.

In re potting the Phlox care must be taken not to break or reduce the ball, although shifting from a 12 to an 18-inch pot, as on this particular much of the future success of the plant depends. Should large specimens be wanted, those that have flowered once may be kept over winter in a cold frame, and if this is inconvenient they may be plunged out of doors and covered over with 3 inches of coal ashes or tanners' bark, taken up early in spring, and re-potted and thinned to three or four stems, and treated as formerly directed; they will then amply repay any care and attention that may have been bestowed upon them.

The following are well adapted for most purposes, being dwarf and bushy in habit:—

Abdul Medschid Khan.
Admiral Linois
Alice Allain.
Amabilis.
Antagonist.
Colonel Dundas.
Countess of Home.
Criterion.
Dr Leroy.
General Brea.

Harold.
Lichniflora.
Leonida.
Madame Couslin.
Masterpiece.
Monsieur Fontaine.
President M'Carel.
Princess Mathilde.
Queen Victoria.
Rubra.

It may be added that a collection of Phloxes, kindly presented to the Horticultural Society by Messrs Downie & Laird, may now be found in the Gardens at Chiswick. Many of the same varieties are also at present beautifully in bloom in private establishments, and for the decoration of mixed borders nothing could possibly be handsomer.—*M., in Gardeners' Chronicle.*

ON THE DEVELOPMENT OF THE YEAST PLANT.

BY MR JOHN LOWE.

(Read at a late Meeting of the Edinburgh Botanical Society.)

After some general remarks on the nature of yeast and the yeast plant, Mr Lowe proceeded to observe that, under the microscope, brewers' yeast consists entirely of cells, spherical in form, transparent and nucleated, varying from 1-7500th to 1-2500th of an inch in diameter. The nuclei are highly refractive, and vary from two to ten in number. These nuclei were termed *globuline* by Turpin.

The growth of yeast has been divided by Pereria into three stages. 1st, That in which the cells are single; 2d, That in which they have become elongated and form a mycelium; 3d, That of aërial fructification. The first stage, or that of yeast proper, is said by Mitscherlich to consist of two kinds, viz., *oberhefe* (or surface yeast), and *unterhefe* (or sediment yeast). These two varieties are propagated in different ways, and each produces specific results upon the fermenting liquor. The *unterhefe* is the ferment of Bavarian beer, which is allowed to ferment very slowly, and at a low temperature. The formation of lactic and acetic acids is thus avoided. The following is a brief account of the changes which I have observed yeast to undergo in the process of fermentation at the distillery of Messrs Duncanson, and at the brewery of Messrs Jeffrey, to whose kindness I am much indebted. Before its application to the wort, yeast is seen to consist of isolated cells of a spherical form intermixed with some which are oval or tubular. These latter are only formed on the surface of the yeast where it has come in contact with the air. They are the commencing mycelium, and should never be present in any considerable quantity, as they materially affect the process of fermentation. The spherical cells are seen to be of two kinds; the one having a thin very transparent cell wall, containing from two to ten nuclei, these are found in yeast which has become sour, and they are usually met with at the bottom of the yeast cask. They appear to correspond with the *unterhefe* of Mitscherlich. In specimens of yeast kept in bottles I have found that the cell wall became thinner and the nuclei more numerous in proportion as the fluid became more acid. The other kind of cell has a thicker cell wall, and contains, instead of a number of nuclei, a large globular, granular mass or blastema, which, in older yeast is converted into nuclei. This is the most perfect form of yeast, and is the only kind which should be used. Its activity I have found to be always proportionate to the thickness of the cell wall, and this, a most important subject to brewers, can easily be determined under the microscope, and thus the value of any specimen of yeast made apparent. After being added to the wort, yeast, which consists of the two varieties of the cell above mentioned, is observed to undergo two kinds of growth. The nucleated cells, with the thin walls, burst and liberate the nuclei ("*globulius seminiferus*" of Turpin), which then increase in size, and become like the second kind of cells. This is the form of propagation which Turpin observed in the rupture of the cells, although he makes the cell contents appear to be finely granular instead of nuclear. I am satisfied that it only takes place in old acid yeast, and not as Turpin imagined as a result of normal fermentation; and this explains why others have failed to observe the process of bursting in fermenting yeast, for it can only be seen on the first addition of the yeast to the wort; and, moreover, in new yeast these cells are often altogether absent. The thick-walled cells, and the enlarging nuclei, after the period varying according to the temperature and the activity of the yeast, are observed to put forth minute bud-like processes, which soon separate and enlarge themselves, afterwards undergoing the same process. This is the second mode of growth noticed by Turpin, and is, in fact, the only result of true fermentation. My own observations confirm those of Mitscherlich, who thinks the true modes of propagation just mentioned are the only ones, and that the conversion of '*globuline*

into cells is entirely erroneous. The budding was observed by Turpin to begin after an hour, and the gemmations were doubled in size in three hours; in eight they had attained the size of the maternal cell. There can, however, be no stated time for these changes, for they vary with the temperature. In distillery wash, which is worked at a much higher temperature than brewery wort, the process begins much sooner, and is sooner completed; and, as might be inferred from the fact of their rapid growth, the cell walls are much thinner in the former than in the latter. One very important fact results from this, viz., that yeast which has been worked at a high temperature loses a considerable amount of its activity. It is in fact "forced," and if yeast of this kind be applied at once to work at a lower temperature, the process of fermentation will be late in commencing, and will often stop. If, however, the yeast be allowed to stand for a day or two it recovers some of its activity, but it is never so good for working at a lower temperature; and, therefore, as a general rule, yeast should always be worked at a higher temperature in each succeeding operation, that is, it should, if possible, be worked in cool wort before being applied to wort which requires to be worked at a greater heat. As soon as the process of fermentation has attained its maximum, the budding begins to decline, and ceases towards the close of the operation. The cells, which were before of very variable size, now became more uniform, and the nebulous mass in their interior assumes a more definite outline, and appears to be finely granular. After remaining on the liquor for five or six days, a portion of the cells which are exposed to the atmosphere become oval and then elongated into tubes, multiplying still by gemmation and fissiparous division. Similar formations are also found in the sediment of the tun. This is the first stage in the formation of the mycelium, and exercises an influence of an important kind over the fermentation of the liquor. The subsequent changes consist in the formation of a mycelium composed of a network of ramifying tubes. These tubes are identical in form with those given in a previous paper, and need not therefore be again described. The perfect fructification in the specimens which I have examined is that of *Aspergillus glaucus*, but there can be no doubt, as I have before remarked, that other species and genera are also present. In proof of this a series of experiments were made in Messrs Jeffrey's brewery, with the following results:—1st, A quantity mixed *Penicillia* and *Aspergilli*. (*P. glaucum*, *Asp. glaucus*, *A. nigrescens*, &c.), were placed in a gallon of wort, at a temperature of 65° Fahrenheit, and allowed to stand in the tun-room. On the second day the surface was covered with specks of foam. On the third day the fermentation had fairly set in, and the surface became coated with pale yeast, which, under the microscope, exhibited oval non-nucleated cells in a state of gemmation. On the fourth day, the fluid gave off a nauseous "foxy" odour, which disappeared on the sixth day, when the yeast cells were observed to have become spherical, and in all respects like good yeast. On the eighth day, the yeast was removed from the surface and applied to a fresh quantity of wort at the same temperature. This entered into fermentation on the first day and exhibited all the characters of perfect yeast. The second experiment was made by placing a portion of *Penicilium glaucum* in wort, under the same circumstances as in experiment 1. The same series of phenomena ensued, ending in the production of good yeast. A third and fourth experiment was made with *Aspergillus glaucus* and *A. nigrescens* with like results; the only difference being that the sporules produced by the latter were at the commencement larger and more spherical than in either of the other species, from which it may be inferred that this species would yield a better kind of yeast. The idea that yeast can be produced spontaneously in nitrogenous fluids we hold to be entirely erroneous, for we see that the lower class of fungi are capable of yielding it, and from the general distribution of these they must be present in every kind of exposed fluid. Another subject which has not received the attention which it deserves is the growth of fungi on malting barley. Whole floors of malt may be seen in summer time covered completely with various fungi, which grow from the

interior of the grain, and ramify within the perisperm. These must have a most important influence on the saccharine matter contained in the grain, and there can be little doubt that they affect its decomposition, and cause an immense loss to the brewer. The fact that malt made in summer time is never so sweet as that made in winter sufficiently attests to the truth of this observation. It is not improbable, where the fungus is so abundant, as I have sometimes seen it, that one-third of the saccharine principle is destroyed, and the foundation laid for the inefficient working of the wort during fermentation. In conclusion, I would merely remark upon one or two cases of skin disease which I have met with in those engaged amongst the yeast in breweries. Brewers, generally speaking, are not likely subjects for the growth of parasitic plants, but I have met with several cases which seem to me to prove that these are derived from the growing yeast, and thus tend to establish the proposition laid down in my last communication, regarding the origin of skin diseases. In one brewery, I met with two cases of *psoriasis annulata*, and one of *mentagra*. These occurred in the only persons who were engaged amongst the yeast. The former were both situated on the right upper extremity, in the one case on the back of the hand, and in the other, on the anterior surface of the fore-arm, about three inches above the wrist. It commenced as a small red spot, and in eight days had attained to the size of a shilling. On examining it carefully under the microscope, a distinct mycelium was obtained, differing in no respect from the same growth in *favus*, with a recent specimen of which it was compared. I have not yet had an opportunity of making inquiries at all the other breweries, but I have little doubt that other instances of a like nature will be found. Drawings were exhibited in illustration of Mr Lowe's observations.

BALSAMS

On previous occasions we have spoken favourably of the beautiful Balsams grown by Messrs Smith, of Dulwich; charming varieties of all shades of colour, red, white, and mottled, and of unusual size are annually grown by them, and this year forms no exception, for a collection shown the other day by these eminent cultivators of them was pronounced by all who saw them to be in every respect perfect. Some further account of their mode of growing them may, therefore, not be uninteresting.

In sowing they prefer the method of putting one seed in a 3-inch pot, especially if the object aimed at is to exhibit at shows. This should be done about the beginning of March for flowering in June or July. Place them on a gentle hot-bed as near the glass as possible, and the latter should face the south, in order that the plants may be well exposed to light. Let all superfluous moisture escape at the top of the frame by opening it from a quarter to half an inch on bright sunny days if the wind be not too cold or strong. A little more air may, however, be given as soon as the plants have begun to form their first leaves. When the latter have arrived at their full size, the plants should be shifted into larger pots. If plenty of convenience exists, warm greenhouses or intermediate houses with a tan or hot-water pit should be chosen for them, and if it is intended to grow the plants to a large size they may be shifted into 6-inch pots at once, and plunged half way in a bottom heat of from 50° to 55°. Thus situated the roots will soon appear at the sides of the pots, and before they have turned half way round the ball the plants should be again shifted for the last time into 8, 9, or 12-inch pots, according to the size to which it may be desired to grow them. Up to this stage size of plant has been the object kept in view; those who have not the above-named conveniences must be content to sow a fortnight later, still, however, following the plan just described. In the latter case the first shift ought to be into 5-inch pots, and if the help of a hot-bed can be obtained the plants may be plunged in it, taking care, however, not to let the heat get

over strong. A plan frequently adopted by the Messrs Smith is to plant in a pit heated at night from 60° to 65° by means of hot water pipes, allowing an increase on bright days of 10 additional degrees. Let the plants again be shifted into 8-inch pots as before, for the last time.

The raising and shifting being now finished, attention must be paid to protecting the plants from sudden chills either from cold air or from falling off of bottom heat; for if once stunted by cold, first class plants and flowers cannot be expected. Plenty of light and air, judiciously given, is indispensable, and care must also be taken to afford abundance of room; to do them justice they should as a rule stand as far apart as they are high.

Having stated the method of raising, potting, and general management, the next thing is the kind of compost to be used, a point indeed which should have been adverted to before. This should be the top spit from a meadow of rich light loam a year old, cut about four inches in thickness. If this is not to be obtained take the same quantity of fresh soil, and after paring off the turf from the loam, char the former so as to reduce it to a state fit for breaking up and mixing with the loam. Add to this an equal quantity of manure from a spent hotbed, which if turned over to sweeten and dry before mixing so much the better. This compost should then be thrown together, and well chopped and turned (not sifted), so that incorporation may be as complete as possible. In potting always endeavour to sink the plants low enough for the soil to reach the first leaves. If that cannot be done at the first, it should be at the second shift; this is necessary in order to obtain firmness in the pot, and also fresh surface of stem from whence to obtain more roots. The pots should be drained efficiently every time the plants are shifted, and over the drainage should be placed one or two inches of fresh manure from the stable. This will be found very useful to the plants as they advance in growth. As regards manure water the larger the plants are required to be, so in proportion should this be used; but its application must be left to the discretion of the grower, who will be the best judge how often or how strong it ought to be given, for unskilfully administered it is sometimes productive of much mischief. In general Messrs Smith have found the compost above recommended and pure water to answer every purpose.

Good Balsams may also be obtained by sowing in the first, or even as late as the third week in April on a slight or nearly spent hot-bed, transferring the plants at once to 8-inch pots, and placing them in a cold pit about the middle or end of May. These may be expected to bloom in August or September, and will be found to well repay any trouble which may have been bestowed on them by an excellent display of finely coloured blossoms.—*M., in Gardeners' Chronicle.*

REVIEW.

AMPELOGRAPHIE FRANÇAISE, &c.; a Description of the Principal Vines, Methods of Culture and Wine-making, employed in the best Vineyards in France. By VICTOR RENDU, Inspector-General of Agriculture. Published under the auspices of the Minister of Agriculture. Folio. Paris, 1854-56.

(Continued from page 365.)

No. 2.

In resuming our account of this noble work we beg leave to correct a typographical error in our former notice. As our words are there printed, we say that "M. Grobon has portrayed the shoot, leaves, and branch of each of the Grapes in the most vivid, natural, and graceful manner." *Branch* should have been *bunch*. Indeed, the bunches and berries are the most wonderful things in these admirable coloured engravings. So vivid and life-like they are, that we could almost imagine that the birds would peck at them, as they are said to have done with Grapes painted by Zeuxis, in his

pictorial competition with Parrhasius. We are never wearied in looking at this part of the work.

We promised to give some account of the Wines of Champagne; but we find that the subject branches out into such numerous details that only a few bare outlines are possible in a paper of ordinary compass. These wines, which are grown in what is now called the department of Marne, seem to have been noted as early as the 9th century. It was only, however, at the coronation of Henry III. of France, in 1574, that they were allowed to compete with the previously more highly valued products of the vineyards of Burgundy. Still it was not till the eve of the Revolution that they entered extensively into commerce. In 1780, a merchant of Epernay sold 6000 bottles of foaming Champagne. Seven years later a merchant of Pierry collected 15,000 bottles. "At the present day," says M. Rendu, "millions of bottles are despatched to all points of the globe. The whole world pays tribute for it; and France, applauding its progress, has inscribed the name of Champagne in the number of the wine-growing districts of which she is deservedly proud. It is one of our œnological crowns."

In the department of Marne, upwards of 40,000 acres are planted with Vines. Three arrondissements—those of Epernay, Rheims, and the canton of Vertus, a dependancy of Chalons—produce first class wines; the rest yield only common wines. The above-mentioned districts form two great topographical divisions—the River Marne, and the mountain of Rheims—the former producing the Champagne wines ordinarily so called, and the latter the mountain wines. Of the former the most celebrated vineyards are those of Hautvilliers, Ay, Mareuil, &c.; Epernay, Pierry, &c.; Cramant, Oger, and others too numerous to mention. Of the latter, Verzy, Verzenay, Sillery, &c.; Saint-Thierry, Marsilly, &c.; and Bouzy, are the most signal. Of the river wines there are several varieties, the frothing, the half frothing or creaming, and the still. In France the connoisseurs consider the creaming or sparkling wines as the best, and they accordingly fetch the highest prices. In this country the frothing wines are most in vogue. The latter are understood to be imperfectly fermented, and to be defective in true vinous quality. To fit them for the English market they receive a considerable dose of sugar and alcohol. Formerly many of them had a pink tint; they are now nearly all white, even black Grapes being employed to make wines of that colour.

The kinds of Grapes employed are mostly of the Pineau family, of which the principal are the *Plant dore'* d'Ay or *franc Pineau*, the *Plant vert dore'*, and the *Plant gris*. The *Gamai* and the *Epinette* are also grown in some districts. The *Epinette* is more cultivated on the Rhine and the Moselle, to which, as Champagne approaches in position, it is also allied in the characters of its wines.

The soils of the principal vineyards are mostly composed of loose marl, lying on beds of chalk, and occasionally mixed with flints. In preparing for planting, the ground is trenched to the depth of 20 or 22 inches. Rooted plants, either from cuttings or layers, are arranged in rows in the quincunx fashion, about 18 or 20 inches from each other in the rows, and about 3 feet between the rows. They are lightly manured when planted. In the mountain district, this operation takes place in April; in the river vineyards, it is performed in fresh weather any time during winter. It would be tedious to go through all the dressings bestowed on the ground in summer; the work is performed chiefly by the hoe, and the notable vineyard of Ay is said to be kept as nicely as a garden. As a general rule, the vines are pruned in the form of low bushes attached to trellises or horizontal rails; and to aid this, they are every few years systematically layered, by a mode of treatment which throughout France is called *provignage*. They receive considerable supplies of manure, or of rich compost, formed of one-fourth of stable dung, and three-fourths of fresh loam. The consequence of these operations is, that the Vines often grow on low ridges, and in soil which is in great measure artificial.

The vineyards are mostly in the actual possession of the proprietors.

The work is done either by the piece or on day's wages, which vary from $1\frac{1}{2}$ francs to $2\frac{1}{2}$ francs for men, and from 1 franc to $1\frac{1}{2}$ francs for women per day. The vintage in fine years begins about the 15th or 20th of September, and in late years not before the 15th of October. The Grape gathering is chiefly in the hands of women, armed with a knife and basket. The Grapes are carefully picked on the spot; all the berries pricked by insects, or spoiled by hail, being removed; they are then carried to the wine-press and trodden under feet. For the details of the subsequent manufacture of the wine, we must refer to the work of M. Rendu. In January or February the wine is bottled, and corked. At a subsequent period the bottles, which have been kept lying with the corks downward, undergo a process which is called *degorgement*—that is, the corks are drawn, and the sediment which is collected near them, is blown out by the force of the contained carbonic acid gas. By this operation, and in consequence of the previous bursting of many of the bottles, about one-fourth of the liquor is commonly lost. After this operation the wine ordinarily arrives at maturity in the third year, and if of high quality will remain good for twelve years. It appears that the finest Champagne wines are seldom the products of a single vineyard, though they do not admit of the admixture of growths from other parts of France. M. Rendu remarks:—"In the opinion of very skilful *fabricants* a mixture of a third of Sillery, Verzenay, and Bouzy, a third of Mareuil, Ay, and Dizy, and another third of Pierry, Cramant, Avize, and le Mesnil, constitute *par excellence* the white wine of Champagne. Other manufacturers, not less expert, declare that a mixture of Ay, Pierry, and Cramant, forms a perfect wine. Each of these vintages taken separately leaves something to be desired: associated, they reciprocally complete each other." We give these names as designating "les millures crûs," the best sorts of Champagne wines; but we cannot help suspecting that the "*fabricants*" in question must be of the family of the renowned Sancho Panza, for, as we learn from the veritable history of Don Quixote, he had two brothers of such acute tastes, that when a barrel of wine was broached, the one declared that it had the taste of iron, and the other that it had the flavour of leather: they were both laughed at, but lo and behold! when the barrel was finished, a small key with a leather thong attached was found in the bottom of it. Doubtless either of the above mixtures would be infinitely better than any composed in this country, into which green gooseberries and Rhubarb stalks are said to enter with liberal profusion. We would rather drink from the hands of the French than the English "*fabricants*;" but commend us, we say, to Ay or Epernay or Sillery "*pur et simple*." We fear that not much of them in that state is likely to come our way. It was in the pure form that these wines acquired their high character—"that royalty," as M. Rendu calls it, "which Champagne maintains and strengthens every day in spite of imitations, or rather counterfeits, vainly opposed to it. It is not enough," he adds, "that a wine be more or less frothing, to elevate it into the rank of a wine of Champagne: it should unite in it other and more essential excellences—fineness, delicacy, perfume, savour, spirituality, transparency, vivacity, ideal lightness,—rare and precious qualities which make this wine a wine that dwells apart and alone."—*N. B. Agriculturist*.

CULTIVATION OF TRUFFLES.

A pamphlet has lately been published in France upon this subject, by M. Martin Ravel, a well-known truffle merchant, which contains so very original and curious a theory that it has been thought an outline of it would not prove uninteresting. M. Ravel has been remarkably successful in the cultivation of truffles, although it must be confessed that the views propounded in his work are so contrary to all the past experience of naturalists, that

they will require very searching investigation before being at all generally received. M. Ravel begins by saying that up to this time naturalists have believed that the truffle was an ordinary vegetable product, and that it had, like other plants, its characteristic life and vegetation; but his opinion is that the truffle is merely produced accidentally in the vegetation of the oak by the prick of a fly, to which he gives the name of "truffigène." It is admitted in natural history that certain flies prick certain plants in order to produce excrescences which protect their nest of eggs, and these excrescences vary in their character according to the different plants upon which they are produced.

The prick made in the branches of the oak tree by the gall-fly produces the gall nut, which contains gallic acid; a similar prick made by the "truffigène," in the fibrous roots of this tree, produces the truffle. The truffle may be considered as a species of gall, produced, it is true, by a different insect, and containing different elements, but the gall and the truffle are both the work of an insect desirous of providing a shelter for its eggs, and preparing food for the larvæ.

With regard to the truffle, the operation proceeds in the following manner:—The "truffigène" fly, that may be seen in winter constantly flying about the truffle grounds, and round the oaks which produce the truffles, penetrates into the ground, reaches the fibrous roots, and pricks them at their extremity to deposit its eggs; the prick causes a drop of milky fluid to ooze out, containing an azotized principle; this slowly enlarges by the addition of the azote, which it continues to receive from the roots of the oak, and it also draws it from the air, if any fissures in the ground enable the air to reach it. If several drops of this milky fluid touch each other in growing, they unite and form those large truffles of irregular and fantastic forms, whose size varies according to the number of truffles thus joined.

The truffle being formed, the roots, wounded by the "truffigène," die, and the truffle, thus abandoned to itself, grows and expands by means of the nourishment afforded both by the earth and the air. M. Ravel states that all who have carefully examined the truffle have been unable to discover in it any germ or radicle, and he brings this forward as a further proof that it is not a vegetable product.

It is only some varieties of the oak which produce truffles, and it is said to be very difficult to distinguish those possessing this peculiarity. One of the surest signs is the total absence of vegetation over the entire space of ground covered by the truffle oak, and when the truffles begin to be produced in the manner just described, every trace of grass disappears.

A barren argillaceous soil is believed to be the best for their cultivation, and M. Ravel recommends acorns to be sown in it, after a plan which he indicates.

A hole about three inches deep is made in the ground, with a conical shaped hammer; the acorn is placed in this hole, and covered up with earth, which is beaten down firmly with the broad side of the hammer; by this means the ground round it is hardened, so that the rats cannot attack the acorn. The distance to be left between the rows depends on the intention of the cultivator. If they are sown with the idea of being transplanted, it is sufficient to place the acorns in a line at the distance of 6 centimetres from each other, with 80 centimetres between each line. In this way there will be sufficient space for the growth of the plants until they are fit to be transplanted. If, on the other hand, it is not intended to transplant them, a distance of 15 centimetres should be left between each, with three metres between the rows.

In order that the "truffigène" fly may flourish and produce abundance of truffles, it is necessary that the truffle grounds should not be deprived of sun. As the young oaks grow, therefore, the plantation must be gradually thinned; the consequence is that the truffle ground is continually decreasing, as well as the quantity of truffles produced, for as the "truffigène" fly only

attacks the extremities of the roots, it is only at the circumference of the circle occupied by the roots of the tree that the truffles are formed. M. Ravel concludes by expressing a hope that his method of culture will be extensively adopted, as he is of opinion that the production would thus be largely increased.—*Journal of the Society of Arts.*

A FLOWER PLOT IN AUSTRALIA.

In the afternoon they came suddenly out upon a great plain, and its appearance called forth instant exclamations of delight and astonishment from the ladies. The plain was many miles in length, and three or four miles across; but the whole surface of it was one blaze of gold. It was like a billowy sea of gold, as the breeze rolled over the splendid flowers of which it was composed, and sent towards the travellers a rich fragrance. All round the aureate plain was hemmed in by dark forests, and over them in various directions showed airily the blue summits of distant mountains.

"We thought you would be rather amazed here," said Mr Fitzpatrick and Charles, who had themselves been up to the station; and indeed their amazement and delight was unbounded. They all descended both from carriage and horseback, and ran into the prodigal flower ocean. The scene was in truth remarkable; the flowers consisting principally of two kinds—a fine large and fragrant hawkweed, and a plant which sent up a dozen or more clean straw-like stems of a yard high from each root, on the summit of each of which was a solid globe of vegetable gold, an inch or more in diameter. Interspersed amongst them were large purple vetches, or Swainsonias, of a most delicious vanilla scent, and various kinds of white and yellow everlasting. The whole was planted by nature in raised beds of a loamy mould, kept as clear from other plants or grass by the same wonderful power, as if it had been done by an army of gardeners; and between these innumerable beds were walks of solid turf, but half hidden by the luxuriant billows of the golden efflorescence.

"Wonderful! wonderful!" exclaimed the ladies, who walked enraptured about in this glorious garden of nature up to their very waist in the fragrant sea, and gathering handfuls of the superb blossoms as if they could never have enough.

"But you do not see the grandest thing of all," said Mr Fitzpatrick.

"What is that?" asked the ladies, "What can be more enchanting than this scene?"

Mr Fitzpatrick pointed, with a face full of significant pleasure, to a hill on the opposite side of the plain, and said, "Tallangetta!"

"Tallangetta!" exclaimed the ladies in one breath, and in the liveliest tone; and they stood in silent delight, as riveted to the spot. The scene indeed was well calculated to call forth this admiration. They beheld a range of bold hills,—bold in altitude, but soft and delicate in their outlines. They were covered with grass and dotted over with trees of a peculiar character—the Casuarinas or Shiacks—part of which, with their more rigid and outstretched branches, resemble pine trees, and others with theirs drooping gracefully, resembling large trees of broom. None of the ordinary gum-trees grew on the slopes of the hills, but their thick masses appeared here and there peeping from their summits. At places stony crags shot up on those summits, varying the softness of the scene; and to the right swelled up a more lofty hill, the upper parts of which were already scorched by the sun to the pale hue of sere grass. Half way up this hill stood a white house consisting of two ranges of buildings, united by a colonnade, and around it extended a considerable space of gardens and vineyards, enclosed in a ring fence.

"That is Tallangetta; that is the Squatter's Home," said Mr Fitzpatrick, evidently delighted with it himself, and seeming at the moment to forget

his own far nobler house at the foot of the Cheviots, or the pleasant old brick manor house on the banks of the Trent.—*The Squatter's Home*, by Wm. Howitt.

CALENDAR OF OPERATIONS FOR AUGUST.

FORCING DEPARTMENT.

PINES.—Those lately shifted and intended for early fruiterers next season, will, if all be right, make rapid progress this month, and while they should have every encouragement to do so, there is one point to be particularly borne in mind and avoided, that is, the encouragement of that sort of growth which may be called a mere elongation of the tissues of the plant, and which is the consequence of too close an atmosphere and a high night temperature. A free admission of air, and as much light as can be secured at this season is therefore indispensable to that strong and matured growth, without which, disappointment is almost certain in spring. Guard assiduously against any check at the root, either from too much bottom heat or from extremes in the application of water, and let no amount of attention be considered too much in order to secure healthy root action, so that before the resting season arrives, you may have a pot full of healthy roots. Range the night temperature from 63 deg. to 65 deg., and on no account let the bottom heat exceed 85 deg. Plants considered not sufficiently rooted to shift last month may now be shifted; these will form a good succession to those more in advance. In potting them use a somewhat more open soil than is usual for general stock, as they will keep growing and require more or less water later in the season than the more forward, so that a thorough drainage and a soil not retentive of water, is necessary to a sure prevention of an undue amount of moisture at the root. Still continue to pot suckers at intervals, as they become fit to pot, which is the best way to secure a regular succession of fruit. See that fruit which is colouring have a free circulation of dry warm air, and withhold water from the root. Plants that have just started, and that may have been kept dry for a time, should have a good watering and a slight increase of temperature. Continue to sprinkle overhead growing stock on fine afternoons, and make the most of sun heat by shutting up rather early in the afternoon; and never forget to put on a small amount of air for the night.

VINES.—If the lifting of early Vines, the roots of which have got down into an unhealthy subsoil, has been contemplated, everything should be got in readiness for the operation by the end of this month. If the Vines have been either unfruitful or subject to disease, there is no remedy so likely to secure health and fruitfulness as that of carefully lifting them almost entirely out of the border, and making such provision in the way of drainage as to prevent any possibility of stagnant moisture; this, with the application of a fine healthy sandy loam, is, all other things being equal, sure to be of great service in such cases. This operation is often driven off till too late in the season. It should be performed before the Vines shed their foliage, and while there is some natural warmth in the soil. Everything should be in readiness before-hand, so that the roots be replaced in their proper element in as short a time as possible; and if lifted, and re-planted near the surface with that care which such an operation demands, the Vines, instead of suffering in any way the following season, will be greatly benefited. Of course, provision should be made to ward off all rains from the border throughout autumn and winter, and for the application of bottom heat at starting time. Grapes intended to hang through the winter, and that are now colouring, should be assisted with a little fire-heat, and a circulation of warm dry air. Should there be the least signs of red spider on these, get rid of it as soon as possible. The preservation of the foliage in health is of the greatest importance, not only to

prolong the hanging of the Grapes in a sound and plump condition, but for the proper flavour of the fruit. To the same end, it is also of vast importance that the border, if outside, should be thoroughly protected against drenching rains, which chill the border, destroy the root action, and so renders the chances of healthy foliage and fine fruit still less. The same protection from rain in the case of Vines that are to be started early is of the greatest service for the retention of the natural warmth in the soil, and the preservation of the young roots. Pot Vines intended for early forcing will, this month, if former directions have been attended to, be as hard and brown as a walking-stick, with dark plump buds, which are far surer signs of fruitfulness than any amount of strength with the absence of such conditions. If not already removed to the open air, place them for a time in an open airy situation, and place the pots so that worms cannot intrude. Get loam and other material in readiness for new borders, where such are contemplated.

PEACH HOUSE.—Nothing to add to last month's directions, any further than to guard fruit against the attacks of wasps, flies, &c.; and for this purpose there is perhaps nothing more effective, and less injurious to the trees that are on the back walls, than Hawthorn's hexagon netting. The same material nailed in the openings of the houses does not exclude the proper amount of air.

ORCHARD HOUSE.—Give every attention to trees from which the fruit is picked for the purpose of keeping red spider in check, and to this end use the engine and syringe with vigour. Fruit that is wanted to hang late in this department must also be thoroughly protected from insects; a good way is to throw some light thin gauze over the individual tree, and fasten it round the stem. In this way fruit can be kept in this house till far on in the autumn, especially late varieties of Plums. Give a free circulation of air at all times. Thin out any superfluous shoots from the plants, and give every chance of ripening to that wood which is intended to be left for bearing next season.

MELONS AND CUCUMBERS.—Get Cucumbers intended for winter supply planted out directly, if not accomplished by the end of last month. Beware of putting these in a soil that is heavy and retentive of moisture. Let it be light, open, and tolerably rich in leaf mould. It is not necessary to have a great depth of soil for these, as the roots of Cucumbers run mostly near the surface of the bed; grow them on through this month with plenty of air, so as to ensure strong plants before damp close weather arrives, which is so often certain death to Cucumbers with thin flabby foliage. Those still in bearing should be encouraged with topdressings, and occasional waterings of liquid manure. Maintain a night temperature of 70°. Secure a dry warm atmosphere to Melons that are ripening, otherwise their flavour will be sure to be deficient.

STRAWBERRIES IN POTS.—If the directions of former Calendars have been carried out, these will be fine strong plants, with the pots apparently full of roots, and nothing else. Should the weather be dry and hot, give liberal waterings of liquid manure two or three times a-week. Keep them free from runners and weeds, and as the nights get cold and damp, it is preferable to water in the early part of the day, as the drier they are at night, the less likely are they to be affected with blotched leaves.

FLORISTS' FLOWERS.*

HOLLYHOCKS.—No time must now be lost in shortening those intended for exhibition; this must be regulated according to the height of the spikes required, and the time they may be wanted, so as to have a full development of the flowers from the base to the top. Protect the flowers on the spikes by shading from high winds, rain, and hot sun. Put in the side shoots as cuttings, and water freely if the weather continues dry. Have the plants secured to stakes.

* By Mr J. Downie, of Downie & Laird.

DARLINS.—Be careful to protect such blooms as may be wanted for exhibition, thinning and disbudding may still be continued where there is a tendency to too many laterals.

PANSIES.—Plant out those intended for an early bloom next season, and continue to put in cuttings of any new or scarce varieties, and plant out into the open border those sufficiently rooted. Those intended for pot culture should be potted towards the end of the month, selecting healthy, bushy plants for this purpose. Should there be any appearance of mildew, dust with sulphur. Continue to save seeds from any of the choice sorts, which sow as soon as ripe, in seed-pans, so that they may be protected in a cold frame during winter.

PELARGONIUMS.—Continue to pot off young plants as soon as they are sufficiently rooted, and stop any that may be getting long; those young plants topped some time since should be repotted and kept growing on. If not previously done the old plants that have been cut down should be shaken out from the soil, and their roots well cut back and repotted again into pots much smaller, with a good amount of drainage; give the plants a gentle watering to settle the soil about the roots—place them in a close frame, and shade from the mid-day sun. Sprinkle with soft water occasionally, and as soon as the plants begin to make fresh growth; give air gradually. Treat Fancies in the same way, only use a lighter soil, and have all secured under glass by the middle of the month. Carry on with expedition the propagation of the stock for next season, so as to have the plants well established before winter sets in.

CINERARIAS.—Take off cuttings or suckers, if these can be got from the old stools; keep them in a close frame till well rooted. The first struck plants will now require a shift; use a moderately rich compost. Pot off seedlings, protect from heavy rain and hot sunshine, and have all under protection by the middle of the month in case of sudden frost setting in.

AURICULAS.*—Keep the plants free from decaying leaves; stir the surface soil as requisite; give them a regular supply of water, and allow a thorough circulation of air among the plants. Allow them to have none of the autumnal rains.

POLYANTHUS will make considerable growth during the month. Keep them in the shade, and free from decaying leaves. Water the plants as they stand in need of a supply.

RANUNCULUS.—Lose no time in preparing the beds, according to the directions of last month. During the winter months keep the surface soil in a loose state by occasional stirrings with a Dutch hoe, and allow no weeds to grow.

TULIPS.—Continue the turning of the soil intended for the beds, and get the offsets arranged in readiness to plant them next month.

PINKS.—Plant the blooming bed as early as possible that the plants may be well established before winter. When the plants are planted singly, plant in squares of either eight or nine inches apart each way. When three plants are planted in the triangular form, they will require to be planted in squares a foot apart. When planted in this form, let the plants be about three inches from each other. A great convenience results from this form of planting; one blooming stick serves for the three plants. About the end of the month pot a few plants in small pots, and place them under glass to supply vacancies in the spring.

CARNATIONS AND PICOTEES.—During the past two months the weather has been the finest we have had for the last six years, for the healthy growth of this favourite flower. Prepare some compost as early as possible for potting the layers in for winter preservation—three parts of light loam, and one part of leaf mould, with some sharp sand intimately mixed will be found very suitable. The first put down layers will be found to be well-rooted by the middle of the month. So soon as this is ascertained, remove the peg, cut off the

* By Mr G. Lightbody, Falkirk.

layer beyond the first joint with a sharp knife; remove all decaying leaves before potting. Single plants may be potted in 3-inch pots, pairs in one of four inches, and three plants in one of five inches. After potting, keep them close under glass for a few days till they have struck root. When they have done so, give them plenty of air, and harden them, so as to stand the winter. Give a supply of water as they require it.

CHRYSA nthemums.*—Disbud plants for large cut blooms, as soon as large enough to handle, leaving the centre bud. Strong plants may have two or three shoots and each with a bud. Some sorts will only produce fine flowers from the centre bud, such as Dupont de l'Euve, others again the best flower from the bud next to the terminal one, such as Cristoph Colombé.

Specimen plants and Pompones must have the liquid manure increased in strength from time to time, as the season advances, to get well swelled buds and retain lower foliage. Should quality and not quantity of bloom be a desideratum, disbud, leaving only one or two buds on each lateral.

AZALEAS.—Take in specimens standing out of doors towards the end of the month. Should there be any Thrip visible, fumigate with tobacco till they are all destroyed. If any young plants are still growing, give them all the light and air possible, and give them no more water than is absolutely necessary, as the sooner the wood is matured the better.

EPACRIS.—Get all the pots cleaned, and examine the drainage before housing, which should be done before the end of the month. The early cut down plants will be well set with flower buds in the axils of every leaf.

NOTICES TO CORRESPONDENTS.

H. ARCHER.—Consult Edward's Almanack for a List of Nurserymen.

P. R., Perth.—The following are about the heaviest Twelve Gooseberries known, viz., Paris, London, Wonderful, Alderman, Flixtonia, Peru, Catharine, Teazer, Hue and Cry, Thumper, Overall, Antagonist.

A PINK-FANCIER should add the following to his collection:—James Hogg (Bragg), Adonis (M'Lean), Richard Andrews (Turner), Colchester Cardinal (Norman), Mr Hobbe (Looker), New Criterion (M'Lean), Field Marshal (Hailes), Mrs Normau (Norman), Peter Young, Mrs Stevens (Looker), Elizabeth Gair (Lightbody), Optima (Turner).

J. S., Pitlochry.—The *Scottish Gardener* is furnished free by post at 7 Shillings per annum. Write direct to the Office, 377, High Street, Edinburgh.

PANSIES.—C. S., Berwickshire.—Elith, light ground, heavy purple belting colour—well defined, but wants solidity in the blotch to make it a first-class flower.

C. H., Carlisle.—A List of the New Pansies, Hollyhocks, Phloxes, Dahlias, &c., will be given in the October Number of the *Scottish Gardener*.

J. O., Perthshire.—The Grand Dahlia and Hollyhock Exhibition will be held in the Experimental Gardens, on Thursday, 10th September. Apply to Mr Lamont, 14, Fettes Row, Edinburgh, for a list of the prizes.

MOSS ON LAWN.—Can you inform me in the next number of your periodical what treatment I can pursue in order to rid my lawn of a large proportion of Moss, which constantly appears in the place of Grass. My residence is situated in the South of Lancashire; the soil is clayey, but I believe it to be well drained. If you can suggest any course of treatment—either manuring or any other—that would encourage the growth of the grass, I shall be obliged.—T. W. [Unless your lawn is thoroughly drained, have it done; then sow it with 20 bushels of equal parts lime and soot to the acre, and let it be well raked over with a heavy iron rake, to disturb the Moss as much as possible from the roots of the Grass; and during moist weather give it 1 cwt. of nitrate of soda to the acre. Let this be carefully sown, so as not to let handfuls of it fall on any given spot. The above process will strengthen the Grass, weaken the Moss, and give the lawn a rich green colour.]

* By Mr Laing, Dysart Gardens.

THE SCOTTISH GARDENER.

GEOGRAPHICAL DISTRIBUTION OF PLANTS.—No. 2.

IN a former paper it was remarked that there are certain laws which govern the distribution of plants—perhaps it would be more accurate to say, that there are conditions to which their respective life and physiological structure are adapted, determining their several places in the world of nature,—in either case by the wise appointment of the omnipotent Creator.

I. *The first* of these laws, or conditions, relates to the *stations* of plants; that is, their locality, the substance to which they adhere, the soil in which they grow, or to speak more generally, the element which they occupy. Some grow in water, some on land, in its numerous forms of loam, sand, rock, &c.; some grow out of the substance of other plants, or are parasites, as they are called; and some, supported by their stronger neighbours, hang suspended in the air. All of them, in whatever way attached or supported, exist in the atmosphere, or receive supplies of oxygen from it. The flowering water plants raise their blossoms above the surface in order that fructification may take place, and their seeds may be perfected. And the water plants that do not flower—such as the Algæ or Sea-weeds—which live wholly or partially submerged in the sea—these are to be found at various depths, but none, at least in the temperate zone, more than 100 feet below its surface; though, perhaps, it is the want of light as well as of air that fixes that limit.

The tribe of Lichens afford another example or series of examples of the *stations* of plants. In walking along a shore, or wherever rocks are to be seen, or while inspecting the grave-stones in a churchyard, one may observe marks or spots of various shapes, but mostly round, and commonly called weather stains; some reddish, some bright orange, many of them of a greenish or bluish gray—

these spots are in fact plants called Lichens, and they compose a very numerous order. Others grow on the bark of trees. One of larger size, and growing on the ground, is the appropriate pasture of the reindeer. Two others, one in Ireland, and a second in Arctic America, yield a species of food for man. By the latter, called by the Canadians *Tripe de Roche*, Franklin and his companions were sustained for a time on his first journey; and doubtless in his last expedition he had recourse to it, before he and his comrades submitted to their final and yet unknown fate. This natural order, as it is amongst the lowest in organization, is also amongst the most diversified in the stations which it occupies.

Not less curious are the stations affected by the Fungi—one of the most singular and mysterious orders in the vegetable kingdom. The species of these strange plants are estimated to amount to 4000 or 5000. Many of the larger sorts, such as the Mushroom, grow on the ground, but always in connection with decaying animal or vegetable matter. Great numbers are found on rotten wood or fallen leaves; one is discovered on old barrels in wine cellars, and some in caverns, and in the forsaken galleries of exhausted coal-pits, shut up perhaps for half-a-century. The whole series of moulds belong to this order and occur on countless different substances. More than 100 Fungi are true parasites, that is, they live on other living bodies, and are so minute as to require the aid of the microscope in order to see them distinctly. The Mildew in wheat, the *Oidium Tuckeri* on the Vine, and the Potato blight, are species which, by their ravages, have acquired a world-wide celebrity. It is a curious property of these parasitical Fungi that most of them are found growing exclusively on some particular plant. One Mildew selects the leaves of the Rose for its station, to the no small annoyance of the Rose-fancier. One grows on the Bramble, one on the Dock, several on the Dandelion, and one even prefers the common Nettle. How they are propagated is certainly one of the greatest mysteries in the world of plants.

It would be an endless task to enumerate the many and diversified positions of the larger or flowering plants. Some affect the sun, and some the shade; some prefer chalk, and others peat; some like a flavouring of iron, and others a taste of salt. Many live chiefly on the moist air of the tropical forests. Some are true parasites—having no roots of their own, and springing directly out of the bark or sapwood of the rooted species;—of these, the Mistletoe is a well-known example; and still more remarkable is the *Rafflesia* of Sumatra, with its gigantic blossoms, three feet in diameter, the strangest flower that grows. It will be seen at once that a water-plant cannot be expected to thrive on dry land, or a bog plant on a bare rock. Other circumstances, however, come into play. Of the beautiful family of the *Crocus*, a considerable number of the species are found, in their natural state, only on the tops of the high hills of Greece and Asia Minor, where they are happed up by the snow in

winter, and enjoy a soft and sunny spring, and where there is little grass or rank herbage to choke them. Lower down they would infallibly be overshadowed and suffocated by their big and burly neighbours. The larger species of shrubs and trees have considerable power of making themselves at home in new quarters, but they, in general, thrive best in those native sites or habitats, which have been assigned them by the Great Creator.

II. *The second* important condition that modifies the distribution of plants, is Climate, and more particularly the extreme and average temperatures of the places in which they grow. Every one has seen the effects of frost on a Potato field or a bed of Dahlias; both of these are American plants from within the tropics, and but for culture would not long subsist even in Britain; nevertheless, by the skill and care of man, Potatoes are raised as far north as Lapland. With trees that shed their leaves, it is the heat of summer that determines their power of living in a particular climate; for example, more of such trees will live at Paris than at Edinburgh, for though the winters are colder, the summers are warmer at Paris, and therefore the yearly shoots are more ripened, and so better prepared to stand the rigours of the inclement season. On the contrary, more Evergreens can live out at Edinburgh than at Paris, because at Edinburgh the frosts are not so intense as in the north of France. Our common Ivy, which rather loves cool situations with us, cannot endure the fierce extremes of heat and cold in the north-eastern States of America. The average temperature of a place on the earth's surface generally depends, in part, on its latitude, or distance from the equator, and in part, on its height above the level of the sea. Were the earth an exact spheroid, or with no appreciable deviations from a spheroidal surface, and wholly composed of land, or without any marine currents, each parallel of latitude would equably mark a special average of temperature all round its circle; but it is not so, for mountains, and seas, and various other circumstances perpetually interfere with this equability. It is well known, that as we ascend in the atmosphere, the temperature decreases. From data given in *Kaemtz's Meteorology* it is calculated that an increase in elevation of 286 feet, infers a decrease of 1 deg. of average temperature; and further that an ascent of 245 feet is equivalent to a north-going of one degree in latitude. These are probably mere approximations, but they afford a general indication of phenomena which have not yet been very accurately measured. The celebrated Humboldt has investigated this subject with immense labour and perseverance. He has traced on the map of the world, waving lines, called isothermal lines, connecting the places at which the average heat of the year is equal. He has also drawn isothermal and isochimenal lines, marking the equal temperatures in summer and winter respectively. These lines may be seen in Berghaus', Nicolet's, or Johnston's interesting Physical Atlases. The subject is too complex to admit of farther exposition at pre-

sent: but two or three illustrative facts may be stated. The western sides of continents are warmer than the eastern. The movements of the ocean, particularly the gulf stream, the aerial circulation between the equator and the poles, and the directions of the winds, which are only beginning to be ascertained, have doubtless a vast influence. So has distance from, or proximity to, the sea. It is stated by Schleiden that in a former war Russian soldiers were frozen to death while marching to Khiva, in lat. 40° , while at the same time sheep remained in the open air all winter, in the Faroe Islands, in lat. 62° . The same writer mentions that fruits are cultivated at Drontheim, in Norway, which in Scotland are not found much beyond Inverness, 6° farther South.

In studying this subject on the broad surface of the map of the world, the mind gets confused with the multitude and the variety of the details; but happily we can observe the effects of varying *altitude*, at least, within a limited and more manageable range. We can consider the subject *hypsometrically*, as it is called; we can repeat the observations which were first made by Tournefort, about the beginning of the last century, and which, probably, had the merit of directing the attention of botanists to this field of labour. That naturalist, while ascending Mount Ararat, is said to have found, at the base, the plants of Armenia; a little farther up, those of Italy; still higher, those that grow in the vicinity of Paris; afterwards, those of Sweden; and lastly, on the top, the dwarf plants of Alpine Lapland. We do not know that he discovered the identical species; we should suppose rather that many of them were corresponding or representative plants.

The following are heights above the level of the sea at which certain plants cease to grow on the Alps of Switzerland. The numbers express feet, and are borrowed from various authors:—

- 2300, The White Mulberry.
- 2870, The Vine.
- 3500, The Oak.
- 4200 to 5000, Barley.
- 4500 to 5600, Potatoes.
- 6000 to 6500, Larch, and Stone Pine marking the line of trees.
- 8000, Bushes and grass.
- 9000, or, according to Humboldt, 8760, the line of perpetual snow.

By way of contrast may be mentioned the limits of certain plants on the Andes in lat. $1^{\circ} 30' S$.

- 0 to 3000, Palms.
- 1300 to 4900, Arborescent Ferns.
- 6560 to 13,450, Herbaceous flowering plants.
- 8560, The limit of large trees.
- 10,800, Wheat.
- 11,300, Bushes.

12,600 to 14,000, Grass.
 13,000, probably to the summit, Lichens.
 15,700, Perpetual snow.

The numbers relative both to the Alps and the Andes must be regarded only as approximations. An excellent pictorial representation of the hypsometrical relation of plants is given in Humboldt's map of vegetation on the Cordilleras, of which there is a good copy on a reduced scale appended to Dr Balfour's *Class Book on Botany*.

The effects of climate on the distribution of plants may be presented in a somewhat different point of view. We have been considering the variation of the species observable in the ascent of mountains; we may consider the great world itself as made up of two immense mountains placed base to base. But first let us separate them—and to do that we must have a knife as large as the lever with which Archimedes proposed to move the world—and allowing imagination to perform the feat, let us cut the solid globe in two at the equator as one might cut an orange into two halves. Well, set down the two hemispheres on their flat faces on some immense plane, and you have, side by side, two mountains 25,000 miles in circumference, and about 4000 miles high. Put them together again, as you would do the two halves of the orange, and then you have the one world made up of two mountains joined base to base. The only physical difference is that the atmosphere becomes less dense as you ascend a mountain, whereas, in the actual world, the air is rather more dense at the poles than at the equator. This difference, however, need not be taken into account at present, as the variation of pressure has less effect than might have been expected, seeing that trees, which grow at an altitude of 12,000 feet on the Himalayas, thrive vigorously in Scotland at the level of the sea. Let us then traverse one of our half-world mountains, not going up, however, as Tournefort did when he ascended Ararat, but coming down, like Noah, when he left the ark to take possession of the flood-swept plains. We must still be beholden to the same nimble faculty :—

Eager fancy unconfined,
 In a voyage of the mind,
 Sweeps along thee like the wind.
 Sail, nor helm, nor keel, nor oar,
 Need I, ask I, to explore,
 Thine expanse from shore to shore.
 Where the surges never roll,
 Round the undiscovered pole,
 Thence set out, my venturous soul!

—*J. Montgomery's Voyage round the World.*

Suppose us, then, up in the far north; and let us shape our flight southwards to the equator. We need not indeed begin quite at the top, *i.e.*, at the pole, for if there be any vegetation at that much talked of spot, it is certain that no one has been there to see it. Commencing, then, with lat. 75° N., which Humboldt indicates

as marking the line of perpetual congelation at the level of the sea—an estimate perhaps too low—there and northward we meet with that strange production, the Red Snow plant *Discerea nivalis*. The Arctic navigators, as well as some Alpine travellers, found large patches of snow of a reddish colour, and many conjectures were made to account for it. Some said that it was caused by the seeds of plants, some by the pollen of flowers, and others by animalculæ; but no one ever pretended to explain the manner in which these substances got to such out-of-the-way places. At length the Red Snow was placed under the microscope, and it was discovered that its colour was caused by innumerable individuals of a plant of the Lichen order. This is a striking proof of the extension of the powers of vegetable life—a sort of life in death—vegetation in a bed of snow! Yet it is not unexampled. Another Polar snow plant, *Chionæca aranioides*, is mentioned by Humboldt; and the same philosopher informs us that *Podurellæ* penetrate into the icy crevices of the glaciers on Mount Rosa and some other of the Swiss Alps.

Turning our faces southward, in the month of June, we find that the snow is melted nearly up to lat. 75° ; and in a few days the earth is covered not only with plants but flowers, mostly of the *Ranunculus* and *Saxifrage* families. One of the latter, a native also of Scotland, blooming in March on the summit of Benlomond, is said to open its beautiful pink blossoms in about three days after being freed from its covering of snow. Plants have no time to lose in the far North. A brief but brilliant existence have they, in the unbroken light of heaven, seeing the midnight sun for four or five weeks, and ere long enveloped again in their winter covering. But not to tarry with them, lest we too be overtaken by the snow, let us pass over the intervening ground till we come to the region of trees. The first we meet with is a Willow about the length of one's finger; a little farther South is the Birch, at first not much taller; and then, as we proceed, we discover the Mountain Ash: these look upon themselves as trees, when they are as big as our gooseberry bushes. By-and-bye, they are trees indeed; and then they are joined by the Wild Pine and the Spruce Fir, and the other denizens of the Scandinavian Woods. When the traveller has reached the middle, or Southern regions of the Dofra-fell range, he encounters immense forests of veritable trees:

Norwegian Pines, fit to be masts
Of some tall admiral!

On the wings of fancy we flit over to Scotland, and there on the hills of Ross and Inverness-shire we meet with the wild Birch and the Oak and the Abele. We glance at Braemar, with its hoary Scotch Firs and green Brackens. Now we are in the Lowlands—and what shall we assume as the type of these? The common Whin. Smile not, gentle reader! The Whin is a greenhouse plant in Sweden;

and when Linnæus was sailing up the Thames, to visit the wonders of London, he observed the golden Furze on the low hills in Kent, and on bended knees, on the open deck, he returned thanks to his Maker, that he had lived to see the Whin blooming in a state of nature, and in the open air. But since we are on the Thames, we may at once pass southward, and we find Grapes ripening on the walls of the gardens and houses. Crossing the Channel and skipping over the heath-covered hills of Brittany, we enter the vineyards of France between the mouths of the Charente and the Garonne, though these abodes of the Vines are considerably farther north on the Rhine. On the Pyrenees the lower northern slopes are covered with wild Walnut trees, and the corresponding southern declivities with Chestnuts. In Spain the Gum Cistus takes the place of our Whin; and in Portugal the White Broom is the substitute for our beautiful golden blossomed species. There also we meet with the serviceable Laurel, *Prunus Lusitanica*. In the south of Spain we have the Evergreen Oak; and on the rock of Gibraltar the first Palms. Crossing the Straits into Africa:—Between the sea and the Desert of Sahara, we enter groves of Palm trees, yielding those Dates with which in youth we become acquainted in the fascinating pages of the *Arabian Nights*. And as we have now reached the tropics, we may at once speed on to the equator; and in our way thither we encounter Palms, and Dragon-blood Trees, and other giants—real Anakims—the patriarchs of the vegetable world. Some of these are so huge and so old that they seem little, if at all, younger than the flood. Intratropical America is perhaps the most remarkable region in the world for its exuberant and colossal vegetation. There, within a belt of 47° of latitude, it is always raining somewhere; most places have two rainy seasons in the year; and in such circumstances, it is hardly to be conceived what a tropical climate can effect, in raising those “potent sons of moisture and of heat,” which clothe the banks of the Orinocco, or of the still mightier Orellana, and present a series of spectacles not to be equalled on the surface of this nether world.

We are now at the Equator, the base of the northern hemisphere, or mountain as we have imaged it. Our sketch has been faint and slight indeed—something like the first few rough outlines of a wondrous picture—a subject inconceivable in its rich grandeur and fulness of detail. We might now ascend the southern hemisphere, in which we would meet with a numerous series of vegetable forms in a reverse order, but in families mostly different from those in the north. We shall not trouble our readers with unfamiliar names. They know however the Verbenas and Calceolarias of the upper La Plata, the Araucaria of Chili, the Fuchsias of that country, and of the Straits of Magellan. Patagonia has already sent the advanced guard of its contingent in the beautiful Fitzroy Cypress and Prince Albert's Yew; and we may expect a large quota from the Land of Fire, and the rugged promontories of the islands by Cape Horn.

Like the southern Constellations, they resemble while they differ from their kindred in the north. They are all the offspring of the same Creator ; they all show forth his glory, and are obedient to his laws.

THE GREENHOUSE VINERY.

BY MR R. ERRINGTON, OULTON PARK, TARPORLEY.

THERE can be little doubt that those unassuming structures, commonly called by the above title, are much on the increase, especially in England, the land of villas. No sooner does a gentleman of the middle classes begin to ascend in the scale of society, than he perceives that his little garden is devoid of that luxury—a greenhouse. And, indeed, if he be so short-sighted or so busy “making money” as to fail to perceive this, the ladies of his household soon suggest the idea.

Now, amongst the pleasures of gardening, there is not one superior to the planthouse vinery, providing it is successful ; but at the same time, it must be admitted that there can scarcely be a greater plague if unsuccessful. And why should such structures prove a failure ? For two reasons only—first, that in the beginning the object is not properly defined ; and, secondly, that if tolerably well defined, is not carried out in the right spirit. In the first place, it is a great thing to have a decided aim in matters of this kind ; but how few possess it ! And it must be admitted that in gardening matters, so great during any period in the last score years has been the progression, there is no end of the temptations which are continually spread in the way of the amateur. But let me advise all such that, if a greater variety of subjects is entertained than is compatible with a given end, the consequence must be of an unsatisfactory character. An aim then, and one of a right character, is of the utmost importance. Many plants will grow beneath Vines, many will not succeed ; and the rightly judging, or rather selecting, in this way, is the great point to aim at. But the Vine grower should at least decide on one point ; and the question may be put as follows :—Do you mean the pot plants to be subordinate to the Vines, or the reverse ? for assuredly one or the other will be the master. There is no compromising here in any form the fancy may dictate, for at the best it is an awkward problem to solve. Certain it is that in the ordinary course of matters, what are called stove plants, do not submit to the cool greenhouse treatment ; and yet we have some of our best things in this class. Who would be without Gesneraceous plants in their greenhouse ? Yet certain it is that they require at a given period what is called stove heat, and as long as the cultivator can fit the movements and habits of such things to the necessities of his Vines, all goes on well. Where the Grapes are not

required before August, most of our popular flowers may be cultivated with tolerable success, at least such as will bear a temperature during February and March, of from 40 to 55 degs. Any higher amount of heat will of course excite the Vines, and cause them to shoot before it is desirable; and this of course will, by the early expansion of the foliage, produce an amount of shade in the house, incompatible with the well-being of tender foliaged plants. The hard-wooded tribes are in general best qualified to endure this mixed treatment, and amongst the chief may be mentioned the *Camellia*, which will bear almost any amount of shade.

There is one criterion of inadaptability to which I would direct especial attention, and that is what practical men term "drawing." It may be at once determined that plants which "draw" are not adapted to the practice pursued. This drawing is simply a lengthening of the wood of plants between the joints; the intrumodes, as our botanists term them, and is caused by the disproportion the light bears to the heat. Plants of this habit should at all times be kept as near the light as possible, and where they will enjoy a free ventilation; the front benches of plant houses offer the best chances for them. The crowding of plants in vineries, irrespective of the kinds, is another fertile cause of this drawing, as also of the encouragement of insects. Indeed, this is the common fault of vineries of this class. If it be an error, and it is, to pack plants too close together in a regular plant house, where there is no shade overhead, how much more grave does the error become when a roof is covered with such spreading foliage as the Vine; and a tree, moreover, having a constant tendency to produce laterals? It may be taken as a maxim, that no two plants should ever be permitted to touch after the Vine leaves begin to expand. The readers of the *Scottish Gardener* may know that it is not those who have the greatest number of plants in a house that produce the greatest amount of gratification. I have frequently seen more effect produced by a couple of score of pots than by a couple of hundreds. Indeed, whatever the number, they cannot by any possibility give satisfaction in these advancing times, unless the plants are grown well individually. In a house of real pretensions now-a-days, every plant should be in such a condition as not to disgrace an exhibition table. This, however, presupposes the possession of a nursing house, or plant hospital, or available pits or frames. It will be seen here that I have been offering advice to little gardeners; big ones are in a position not to need it; and in pursuance of such, I must advert to some other small matters, which although of a collateral character, possess influence in this affair. As one point, I would refer to the use of artificial heat. I name it here in connection with ventilation, with which it should generally be coupled. It is known to our readers that flowers in a vinery will, during the months of March and April, bear better a temperature of of 65° with a free ventilation, than one of 55° to 60° without it. But it is a fact, and one that every amateur should

make himself familiar with. Let them for a moment observe the propagation houses of our keen nurserymen; generally as low as possible, with a snug span-roof, little or no air given; all as close, quiet, and moist, as any warm secluded dell; and why? simply because of the object in view. And what is that object? let me raise the question in order to illustrate the matter; only to make as big a plant as possible in the least time. This they call hurrying the plant into wood, and it so happens that the very conditions which accomplish this, are decidedly inimical to the production of flower buds. Their young stock is in part drawn; they look fresh, genteel, and full of foliage, and are speedily in the market. Were these knowing persons to take the advice I am about to give to the owners of plant house vineries, as to heat and ventilation, they would never meet their rents and other expenses. There is no harm in indulging in what may be called liberal temperatures during daylight, providing every attention be paid to ventilation. There is a point of much importance connected with this procedure which I must turn to, and that is the avoidance of those miasmatic conditions with which the air of badly managed plant houses is known sometimes to be impregnated.

Now, the best way to avoid all this is heat, in combination with ventilation; in other words, a liberal atmosphere. And when we come to consider the character of such structures, and observe a crowd of Grape foliage overhead, together with the confusion created by a host of pot plants beneath, it appears astonishing that the whole should be beset with so moderate an amount of evils.

The foregoing remarks have reference in the main to pot plants during the winter and early spring: let us now turn to the plants during the months of April and May, for then comes the critical time; and then is the period when, the mere winter-flowering things being on the wane, we look forward to the rising floral gems of a newly awakened spring and a coming summer. As soon as the Vines begin to show their blossom a new condition of things arises, a much greater amount of heat becomes necessary for the Vines, and indeed the pot plants would also enjoy a similar temperature, but for the shade overhead. The question now arises—What can be done? It is plain that towards the middle of April, or sooner, some of the stock must turn out, or the whole will be spoiled; and now it is that people with only a greenhouse vinery, and perhaps a garden frame or two, are puzzled. Their house contains not only Geraniums, Heaths, Camellias, Fuchsias, &c., but certain odds and ends of a more tender character—partly through habit, partly through the excitement they may have undergone. Be all this as it may, the plants must be thinned out, and they must be still kept under glass.

Pits or frames, in the absence of house room, are quite sufficient to preserve and even to encourage them, providing the mode in which they are managed is adapted to the condition they have attained.

Several of the *Geraniums* may give way, especially those which are not up to the mark; those of the bedding class especially, or intended for late flowering. *Camellias* done blossoming, and not required for very early blooming in the succeeding year, may take a kind of rest before making a new growth; and several of the plants known by the appellation of New Holland plants may join them, as also *Ericas*, the *Epacris* family, &c., declining in blossom—together with other things in a similar position. It is not possible here to point to other than a few families, so much do the collections of greenhouses differ; but something more may be alluded to, and that is the kind of treatment to which they ought to be subjected, after leaving the comfortable home they have been accustomed to. The first thing I would point to is the screening them from intense sunlight. Whenever a sudden change of this kind takes place, this is one of the first precautions with a practical person; for plants that have been crammed too close, always have a considerable portion of foliage, which has, through contact or otherwise, not been fully inured to the light, albeit the house they were in has received a tolerable amount of that vivifying element. A slight shading, therefore, is desirable for a little while, and I need scarcely observe that a very low temperature must be avoided—freezing, of course, out of the question. From hence they must be transferred according to the desires and conveniences of the proprietor, who, in a few weeks will have the whole summer before him, and as the season increases, increased changes of re-arrangement.

I am somewhat afraid that the heterogeneous character of the greenhouse vinery as we ordinarily find it, has caused my advice to assume a somewhat irregular character, but really we meet with such a variety of cases, that it is very difficult to class the objects in a way compatible with the means necessary, and which may or may not be at hand. I would again impress on the minds of the possessors of such structures, and those who possibly attend our great exhibitions, that in keeping a limit on their desires, they will assuredly meet with a greater amount of success. Better by far is it to grow a few things well, than by overstraining to undergo disappointments numerous and frequent; and which have a tendency to convert a hobby highly qualified to delight into a source of discontent.

COMPARATIVE HORTICULTURE.

4.—CULTURE OF ASPARAGUS IN FRANCE.

Of this excellent vegetable there are two principal varieties, the *Green* or *Common*, and the *Large Violet* or *Dutch*, the latter having its extremity of a Violet or reddish colour. Certain places are cele-

brated for the beauty of their Asparagus, such as Ghent, Ulm, Vendome, &c., but the varieties named after them approach closely to the Dutch. That of Ulm is of a somewhat deeper colour, and is a little earlier.

Asparagus is propagated from seed. It is sometimes sown on the spot where it is to stand, more commonly it is sown in nursery lines, and the roots when they are of a proper size are transplanted into the prominent squares or beds.

Nursery Treatment.—A plot of light earth, sandy if possible, but at least of sound quality, having been well prepared, and if needful enriched, the seed is sown in October, or from the middle of February to the end of March, either broadcast, or what is better, in rows 8 or 10 inches apart, and $\frac{1}{2}$ inch deep. If the ground is rather strong and inclined to cake, it is well to lay a little light compost or leaf-mould on the surface. Waterings are given when necessary, and the ground is weeded and hoed from time to time. The transplantation may take place after the first year; it is usual, however, to allow the plants to stand two years in the seed-bed.

Preparation of the ground and planting.—The methods are very various according to the nature of the soils. Sometimes trenches are dug out to the depth of 2 or 3 feet or even more; the soil is wholly removed, and is replaced with better soil well manured; and in damp situations there is placed in the bottom a layer of lime rubbish, coarse sand, heath, broom, the twigs of trees, &c. At other times a certain thickness of the soil of the plot is removed and replaced with superior materials. On other occasions trenches from 8 to 15 inches deep are opened, and manure is dug into them at the bottom of the trench. Again, some content themselves with carefully working up the ground, and manuring it well; and then they plant on the flat surfaces.

The arrangement of the plants is not less diversified. Sometimes 2, 3, or 4 rows of Asparagus plants are planted in trenches from $2\frac{1}{2}$ to 5 feet broad (the trenches being formed in the same way as Scotch Celery beds). Sometimes they are planted in single and equidistant lines from 20 to 60 inches apart. The latter method and distance is generally adopted in the neighbourhood of Paris, the spaces between the wide lines being occupied with the cultivation of other vegetables. We cannot say that any of these methods are always and absolutely preferable to the others. We only remark that the employment of elevated ridges, between trenches, is injurious, as they intercept the air and sun, and make the management of the trenches a matter of difficulty.

The great principle to be kept in view is, that as the Asparagus plant is injured by stagnant water, means must be adopted to preserve it from being rotted. Hence some have invented deep trenches with the improvement of their bottoms by drainage, and some have preferred level or even elevated surfaces. As the root attains to the length of 27 or 30 inches, in favourable circumstances, it is

needful to supply it with soil that has been forced, or at least moved to a considerable depth. Sandy, permeable, sweet earth suits it best; if, therefore, the lower layer is arid, poor, or tenacious, it must be replaced with better materials. Turf, and the rotted parings of grass plots, the ooze and deposit of pools and ditches, the soil of old hot-beds are excellent for this purpose. The *Asparagus* plant requires much nourishment and manuring. The trenches are filled up to within 8 or 10 inches of the level of the soil, and the upper layer should consist of 5 or 6 inches of the best and sweetest soil possible, in order to receive the roots.

It facilitates the culture, and the annual operations to arrange the plants in the trenches or beds in two or three rows. They are planted in beds of four rows only when intended to be forced on the spot, as will be described in the sequel. Isolated lines allow more air and nourishment to the plants. The distance between the plants should be from 15 to 20 inches in every direction. In the case of trenches, the intervals or ridges should be 30 or 40 inches broad. With level beds, the paths may be 27 or only 20 inches wide. The corners of the beds should be well marked by strong wooden pins.

The planting commonly takes place in March, or in the first half of April. In lifting the plants, great caution must be used not to break the extremity of the roots which are extremely brittle, and to expose them as little to the air as possible. In putting them in the ground, the fibres are very carefully spread out all round, and are then neatly covered. It is beneficial to add a coating of compost over all. After this, water must be supplied when necessary, and the ground should be stirred occasionally and kept clear of weeds. At the end of October or in November, the withered stems are cut and removed, and a thin covering of fresh soil or compost is given, though this operation may often be more beneficially performed in March. The same cares are continued for the first three years. Some of the finest heads of *Asparagus* may be cut in the third spring, but it is better to delay till the fourth, when the plants are in full bearing. From that period the culture consists in hoeing and watering in summer, and besides two dressings, one in autumn and one in spring. In autumn, the withered stalks are cleared away, and the beds are trimmed. Some immediately thereafter, or towards the end of December, give a slight covering of fresh earth, leaf-mould, or short dung. The dressing in spring consists in a light stirring of the soil with a fork, conducted with caution, in order not to injure the buds; after which the additional soil is given, if that has not been done in autumn. In all cases a liberal manuring every two or three years, applied towards the end of winter, is essential in order to keep up the abundance and the beauty of the products. The quantity of the annual additions of compost is different, according to the quality of the *Asparagus* which is preferred. In Holland and other places, where the cultivators like to have white shoots, with only the points of a violet colour, the plants are covered with

4 or 5 inches of earth, which is again withdrawn at the end of the cutting, or in the beginning of winter. At the end of winter, it is once more replaced; or if it is the year for manuring, the dung is laid on first, and the earth is spread over it.

If, instead of planting, it is wished to sow on the places where the plants are to grow, a drill is drawn, and at the distance of an inch or so, two or three seeds are put in and covered with light earth. After they have sprung, and the plants are well established, they are thinned out properly. The subsequent culture is the same as before.

At Argenteuil and Epinay, near Paris, where *Asparagus* is grown in the open fields, the market gardeners prepare trenches two feet wide, separated by flat ridges (*ados*) four-and-a-half feet broad. In these trenches the *Asparagus* is planted [in two rows] at 20 inches from each other, so that the plants alternate. During the summer the ridges are cropped with Potatoes, Pease, Kidney Beans, &c. In the second year from the planting, and during autumn, a couple of inches of well-rotted dung, or, what is better, a portion of night-soil is spread over the trenches, and is covered with an equal quantity of earth taken from the adjacent ridges. In the March of the third year the plants are earthed up—this is done by forming round each tuft a hillock of earth taken from the ridges (*ados*), a third on each side being employed for this purpose, leaving only one-third for the intermediate culture. The height of these hillocks is about nine inches. In order to make sure that this hillock is right over the plant, a stalk of that height is left at the clearing in autumn, and it is drawn out when the earthing is completed. From August to October, the earthing is levelled down, and by two successive operations is returned to the intermediate ridges. In March of the fourth year a first earthing of about 8 inches is given; and that in the beginning of April is raised to 12 or 13 inches. In July the earth is again withdrawn, and only an inch or two is left over the roots. This operation is annually repeated with manurings every two or three years. The advantages of this method are—1st, the acceleration of the production of *Asparagus*, by the exposure of the roots, and so enabling them to profit by the heat of the sun in spring; 2d, the affording the plant a soil which is friable and accessible to atmospheric influences; 3d, the supplying successively to the plant the earth which is necessary to its development, without retarding its vegetation; 4th, the exciting rapid vegetation, and thereby rendering the *Asparagus* tender and well-flavoured; and 5th, facilitating considerably the gathering of the crop.

To have *Asparagus* in winter and early spring, various methods of forcing are employed: the two following are the most common among the gardeners near Paris:—

To force Asparagus where it grows.—Beds 6 feet broad are formed, with paths 25 inches wide between them. The plants are

arranged in 4 rows, at a foot between the rows, and 10 inches in the row. The bed is made richer than usual, and is carefully cultivated in the usual way for three years. In the fourth year, from December to March, according as the supply is wanted, the pathways are dug out to the depth of 20 to 22 inches, and are filled up with fermenting stable dung well trodden down. A thin covering of earth is thrown over the bed, to increase the length of the *Asparagus* stalks. Frames are placed over the *Asparagus* beds; they are filled up with fermenting dung; and the sashes are placed over all. Twelve or fourteen days afterwards, a little of the dung within the frame is raised, to see if the *Asparagus* has commenced growing; when it has begun to push, the dung is removed from the interior of the frames; and the stalks are cut as they attain a suitable length. The glass of the sashes should be within 6 inches of the soil. The heat is maintained by renewing or stirring the dung, and by protecting it with mats during the night and in bad weather. In April the frames and the dung are renewed, and the paths are filled up again. The plants are allowed to rest a year; after which they may be forced anew, and so on successively till they are worn out.

To Force Asparagus on Hot-beds.—From November to March, hot-beds are made successively $4\frac{1}{2}$ feet broad, 2 feet high, and are covered with 1 inch or $1\frac{1}{2}$ inches of leaf-mould or fresh light earth. On these, frames are put, and covered with mats to bring up the heat: when that is suitable, roots of *Asparagus* 3 or 4 years old, or such old roots as are not desirable to keep, are taken; to render them equal, the rootlets are shortened to the length of 8 or 10 inches. These are placed on end with their crowns upwards, so close that they sustain each other with their tops about the same level. Leaf-mould, or light earth, is introduced between them by the hand, so as to supply them sufficiently, without covering the eyes. The sashes are then put on, and they are dealt with as before.—*Le Bon Jardinier*.

[This article, in the original, is by no means so clear as many others in the Volume. We trust that, so far as we have understood it, we have made it intelligible to our readers. The culture at Argenteuil and Epinay is curious, and worthy of the attention of horticulturists in this country. We are not sure that the reasons for its success given by the *Bon Jardinier* are all equally valid; but we are not prepared to offer any better. For the rest, it is strange to use trenches for *Asparagus* in damp soils; ridges would there seem more advisable. Perhaps the best *Asparagus* we have seen in Scotland was grown in a pretty strong clayey soil, with a liberal top-dressing every winter of sea-weed, which was dugged in in spring. As a seaside plant, the *Asparagus* might be expected to grow best in sand or sandy loam; but it is not easy to make such soils rich enough.—THE TRANSLATOR.]

LILIUM LANCIFOLIUM.

THOSE who have to keep up a display of bloom in their conservatory or greenhouse, will now be very glad if they happen to have a good stock of this *Lilium*. They are just now in full bloom, and render any house in which they may be placed very gay and attractive. At this season of the year greenhouse flowers are rather scarce, and gardeners have quite as much as they can do to keep up anything like a respectable appearance in those houses which are devoted to the purpose of showing plants in bloom. The heat of the weather causes flowers, which are under glass, very quickly to fade and fall, and the very same cause produces an abundant supply in the open garden, so that, generally speaking, the gaiety outside far eclipses the beauty inside, so much so, that not unfrequently the greenhouse or conservatory is passed by entirely. However, a love for the open air and cooling breeze has something to do with that; but it is a fact that cannot be denied, that there is generally more to be seen out in the flower garden, than in the various plant structures in the way of bloom at this season of the year. Just in this crisis (if I may call it so) the *Lilium* comes in to our help, and by having a goodly number of the white and spotted varieties of different shades, the scales (so to speak) may be brought to a much more level position, and the house be made as attractive as the garden. The appearance of this Lily is, in my opinion, very often spoiled by not having a sufficient number together in the same pot. One or two stems, without leaves for one-half of their bulk, growing in six or seven inch pots, have a very poor, yea, miserable appearance. In order to make a grand display, these plants should be grown in very considerable masses—say from fifteen to twenty stems in a pot, and if each stem bears about a dozen flowers, there will be something like two hundred blooms to every pot, and if these are nicely clothed with foliage down to the soil, they will be objects of great beauty, and will not be passed accidentally without being seen; but, on the other hand, they will be greatly admired by those who may see them. The following directions will bring about these results.

They are now in full bloom, and the first thing that I would recommend is to go over them and see that they are all correctly named, for in the course of the winter and growing season, some of the labels may have been misplaced,—for instance, a *Speciosa* label may be in a pot of *Alba* variety. Others may have rotted off, and, consequently, some of the plants will be unnamed. Now is the time to put all these things right, for if they are allowed to go out of bloom, it cannot be done for another season. Being satisfied that all is right on that head, things may rest until the plants go out of bloom, then they will, of course, be removed from the house, for there is no beauty in them when out of flower. The best place is to

put them in the open air, but plunge the pots about half their depth. Here let them have a fair share of attention; do not let them suffer for the want of water in bright sunny days. Here they will remain until the leaves and stems are quite withered and dead, when they may be cut down to the surface of the soil, and the pots removed to some place where they will be protected from the autumn rains, and be allowed to become quite dry. A shed, or cellar, or any such place, is all that they will require for some time to come. They should not, however, be exposed to much frost, for I have learned by experience that they will not bear many degrees without injury or death. The cooler they can be kept the better, providing the temperature does not fall below 32° , certainly not below 30° . While they are in a dormant state is the time for re-potting them. Some let them stay until they re-start into growth again, but then it cannot be done without injuring the young roots, and besides that, a gardener has more time to attend to them while they are dormant in winter, than he has when they are starting into growth in the spring; therefore, for these two reasons, I say do it before the plants begin to start into fresh growth.

Have some pots in readiness, twelve or fourteen inches in diameter, clean and well-drained; then fetch the Lily pots to the potting bench, doing one sort before another is started of. Turn out the ball, shake away the old soil, and separate every bulb, one from the other, laying them on the bench until there are a dozen besides the small ones. Put the twelve roots at equal distances in the pot, which has been previously filled with soil, so that the top of the bulb shall be three inches below the top of the pot, then fill the soil in among the bulbs, and cover them two inches deep. This will leave one inch to hold water when that element has to be applied; name it, and carry it away to its former position, and thus proceed until the whole are finished. The small ones may be put much more thickly in less pots, until they are strong enough for flowering. As soon as the tops of the shoots are seen coming above the surface they must be brought to the light, or they will be drawn and weakly. A greenhouse is now the place for them, with as much air as can be safely given. Do not excite them into rapid growth, but allow them to advance as slowly as possible, in order to secure strong sturdy growth, which will not be the case if they are kept warm and close—from 35° to 40° is all that is required; indeed, any advance upon the last quoted figure would be more injurious than otherwise, and that in proportion to the increase given. In this way things will proceed until the middle or end of May, namely, keeping them as cool and airy as possible, with just as much water as will keep the soil in a nice healthy state. When the time above specified arrives, and all danger of frost is over, remove them from the house to the open air. Choose an open spot, but not one that is exposed to the prevailing winds. Here let them be plunged to the rim of the pots; this will

keep the roots cool and much more regular as regards moisture than they possibly could be, if they were allowed to stand upon the surface during the hot summer months. Here they are to grow unmolested until the flower buds are grown to the full size. Just before they begin to open their blooms, get some moderately strong stakes, and tie up all the shoots so as to look tidy, and have a neat appearance, and if it suits the taste of the cultivator, and is suitable to the position in which they are to stand, they may be trained to "a face," or all sides may be made alike. As they are tied up, they should be placed where they are to stand while in flower. If it can be avoided they should not be removed after the flowers are expanded, because the pollen marks and spoils the appearance of the blooms. The soil in which I find them to grow very well is loam, leaf-mould, and peat in equal proportions, adding a sufficient quantity of sand to keep it open. It is not necessary to shake them out every winter, but if done every two years it will be quite often enough, and the plants will be all that can be desired.

T. J., Manchester.

THE COCKSCOMB.

BY MR J. ANDERSON, GARDENER, MEADOWBANK, UDDINGSTONE.

THE *Celosia cristata*, or the Cockscomb is an Asiatic annual, extensively grown, and universally admired; so much so, that those whose Floricultural tastes are anything but ardent, pause to pay tribute to its decorative merits; and well may they do so, for this class of plants materially contribute to the general appearance of our greenhouses during the summer and autumn months, and well repays the attention of the successful cultivator.

It may very reasonably be asked, What are the properties of a good Cockscomb? but I must confess that there are considerable differences of opinion on this point, and I should feel greatly obliged if we had the weighty opinions of some of your able correspondents recorded. My own criterion is—that the stem should not exceed nine inches, that it should be round and small, that the comb should be more ovaliform than circular; its two extremities to meet; the closer grown, the deeper crimson, and the larger in size so much the better. But I am inclined to lay particular stress upon its stature; I have no sympathy with those gigantic monsters that you require to place on a level with your feet, before you can judge their merits; such are much easier grown to a large size than dwarf specimens—their exuberance is never checked; besides this, they are never seen to advantage on the table of an ordinary show house.

The first thing to procure is good seed from some of the best strong growing varieties, which, if in other respects eligible, may, with a little management, be easily dwarfed down. It can be sown

any time from January to April—perhaps the middle of February is a good medium. Prepare a seed pan, with the usual amount of potsherds, a little fibry matter over this, and a compost of fine sifted peat, leaf mould, and sand, in equal parts; fill within one half-inch from the rim, sow the seed rather thickly, and cover one-eighth part over with the prepared compost; water with a fine rose, and then place it where you have a little bottom heat, with a temperature ranging from 60 deg. to 70 deg. The seeds will soon germinate, and when ready for handling may be pricked out into shallow pans, with a mixture of loam and leaf mould in equal parts, incorporated with a good sprinkling of silver sand, then placed in a temperature as above, as near the glass as possible. In a few weeks they will be ready for potting off into thumb pots, placed in a drier atmosphere of the same temperature, and watered freely at the roots until they show flower. This is the first process.

If you have been thus far successful, you will have nice stubby plants about six inches from the pot, and ready for more vigorous treatment. They should then be repotted into four-inch pots, two or three of the lower leaves nipped off close to the stem, and potted well down. By this method rootlets emit freely from the stem, and assist to make up what was lost in the retarding process. They should then be placed in the highest temperature at your command, exposed—after a week—fully to the sun's rays, and syringed mornings and evenings over head. This is a great preventative to thrip—a pest too prevalent in our horticultural structures. Towards the beginning of May they may be finally shifted into eight-inch pots. If they have any appearance of "legginess," the lower part of the ball must be reduced, a tier more of leaves nipped off, and the plant placed at the bottom of the pot, filled up with your compost, shaded for ten days afterwards to prevent flaccidity, and then submitted to their general treatment. I would recommend the following compost for their successful culture:—Leaf-mould and maiden loam in equal parts, with one-tenth part of sand incorporated with the whole. Diluted guano water may occasionally, but not very often, be served, and when given it must be with the greatest care, as over-feeding may kill their roots.

They will stand as much, if not more heat than any exotic we have, only they delight in a moist temperature. They will probably during their growth require to be fumigated, but great care must be taken; for I have occasionally seen their foliage completely wasted, resulting from this alone, and, however fine heads you may grow, they are comparatively insignificant if denuded of their foliage. To grow them large, they must remain in hot temperatures, but they can be grown respectable for the decoration of the greenhouse, and much finer coloured. To be grown for exhibition purposes, they ought to be a month previous in a cold house, when all acquainted with such can bear testimony to the importance of attending to this.

The comb, as it were, protects its own seed vessels, which are distributed over the interior part of it; sometimes in great numbers, at other times few and far between. It is always my practice to save my own seed of the best of them, and I have never been disappointed with the results.

NEW ZEALAND SPINACH, OR TETRAGONA EXPANSA

BY MR D. THOMSON, DYRHAM PARK, HERTS.

I BEG to call attention to this valuable vegetable, which though introduced into this country in 1772, is yet comparatively little grown—certainly not nearly so much so as its usefulness demands. Where a regular supply of Spinach is required during the hottest months in the year, it is almost impossible to meet the demand with the sorts commonly cultivated, more especially if the soil be light and gravelly; whereas, with a very few plants of this Spinach, a daily supply can be maintained from the middle of July onwards till that variety known as the “Prickly” (which is sown about the middle of August), is fit for use.

The *T. Expansa* is a native of the mountain sides of New Zealand, and has also been found on the shore of the Island of Tongatabu and in Japan. It was extensively used by Captain Cook in his travels, and he had it boiled and served to his men frequently twice a day, and was first brought particularly into notice in this country by Mr Anderson in the *Transactions of the Horticultural Society of London*, volume 4, page 488. In Mr M‘Intosh’s *Practical Gardener*, it is stated that it is a very delicate plant, and can only be brought to perfection by being reared under glass, or a hotbed protected with mats or some other covering. This statement, however, is at variance with my experience in a locality anything but favoured with either soil or climate, where in some cases it has “sown itself,” and vegetated and grown with great luxuriance in the open ground.

The manner in which I usually treat it, is to sow in a gentle heat in March, and pot off when in the rough leaf into 6-inch pots, putting three plants in a pot. They are then hardened off and planted out about the middle of May, on hills 6 feet apart and slightly elevated, mixing about a barrow load of rotten dung with each hill. They are afforded the protection of a handglass for ten days or so, then they are fully exposed. In this way the most luxuriant growth is invariably the result, and the plants soon meet in the row and form one dense mass of shoots and foliage. Some six or eight hills will yield a constant supply for a large family. The failure of the other sorts arises from drought—a circumstance under which this variety, from its succulent nature, thrives admirably, hence its peculiar adaptation to answer the end desired in its cultivation.

STRAWBERRY RUNNERS FOR FORCING.

How do you get your Strawberry runners so early and so strong?

This is a question that has been put to me scores of times, and, thinking that the answer may be useful to some of the readers of the *Scottish Gardener*, I will briefly relate the simple method I adopt, in order to get early and strong Strawberry plants for forcing purposes.

Early in September I select the necessary quantity of well-rooted runners from plants that have been planted out in spring after having been forced, and which always make first-rate runners. These runners I plant for the express purpose of getting my plants for forcing from the runners they make the following spring, and that they may be conveniently laid, and otherwise attended to, they are planted in lines along the borders in the kitchen garden, about a foot inside the edgings, taking care to make the soil rich with manure. They are planted 4 inches apart in the row. Before winter sets in they are well established, and commence growing early in spring. Every bloom bud is removed, and so soon as each plant throws out one or two runners, they are laid for forcing purposes, and I find that these runners are not only the earliest, but by far the best that can be had by any other means, and are ready for their fruiting pots by the 1st of July.

It is by attention to what may appear little matters like these that successful gardening is accomplished, and he who slights them never does so with impunity.

DHAIBHIDH.

CELOSIA AUREA.

WERE I called upon to add one more plant to the excellent list of winter flowering plants given in the last Number of the *Scottish Gardener*, by Mr Errington, I could not make a more useful addition than the *Celosia aurea*. Its graceful habit and effective colour render it unsurpassed, from the end of October till Christmas, for grouping along with other plants in the conservatory; and for mixing in nosegays it is equally effective. Yet strange to say, you may visit a hundred gardens and not meet with a single plant of this old but almost forgotten annual. Perhaps this neglect may have risen in part from the difficulty there is in getting it to seed freely—a point in which I have been very fortunate.

Conceive of a plant some 2½ or 3 feet high, forming a pyramid of pendant branches—something after the manner of *Cedrus deodora*—each branch bearing a spike of orange-coloured feathery-looking flowers, a foot in length, drooping from their own weight, and resembling in gracefulness an ostrich feather, and some idea may be formed

of how beautiful for a vase or stand this plant must be. Elevated amongst a combination of flowering things in the conservatory, it forms a capital "starer," and from its distinctness of habit it never fails to be an object of attraction.

This plant is easily cultivated. I sow the seed about the end of February, or first of March, in equal parts of loam and leaf-mould and a little silver sand. Placed in a Cucumber pit, it vegetates in about the same time as the common Coxcomb; and when young requires to be kept near the glass, to prevent its drawing up weakly and prematurely. When a few rough leaves are formed, I pot off into 3-inch pots, using the same soil. As they fill their pots with roots, I shift them on till they are at last transferred into 8 and 12-inch pots, according to the strength of the plants. In 12-inch pots I generally put three plants together, when they form fine large objects, though perhaps a single plant in a smaller pot looks more perfect and graceful. With the soil used for the last shift I mix some well decomposed dung; and when the pots are well filled with roots, an occasional watering with liquid manure helps to keep the foliage green, and gives vigour to the growth of the plant.

Throughout the summer they are kept near the glass, and syringed once or twice a-day, to keep spider in check, to which it is a little subject. By the end of August the bloom may be seen formed in the tip of each shoot, and they continue to expand gradually till the end of October, when—if assisted with a little fire-heat through the latter month—they will be in full bloom, and continue so in a warm conservatory for months. Draughts of cold air and a damp atmosphere are unfavourable to its continuance in bloom and health, and must be guarded against.

I find the surest way to get seed, is to subject a part of the stock when in 6-inch pots to a high temperature, when they start into flower prematurely, and seed profusely.

DHAIBIDH.

HYACINTH SHOW FOR 1858.

Our readers will recollect of our directing their attention to the splendid Hyacinth Show which took place under the patronage of the Royal Caledonian Horticultural Society in the Music Hall, here, last March, and we have much pleasure in announcing that arrangements are now in progress for a similar competition and exhibition in the Music Hall next March. From the success of last year's show we have no doubt of the greater success of the coming one. Mr Wood of Waterloo Place has kindly given the Music Hall free of charge, and Twenty Pounds to the Prize Fund, and already, nearly other Twenty have been collected, and it is expected more than Fifty Pounds will be subscribed for Prizes. For the benefit of those un-

acquainted with the character of Hyacinths, we subjoin a List of the leading kinds.

DOUBLE RED AND CARMINE.

Princess Royal, new.	Lord Wellington, very fine, with close spike.
Susanna Maria, new.	Sir Joseph Paxton, large spike.
Lieutenant Waghorn, new and fine.	
Waterloo, dark red, useful flower.	

DOUBLE WHITE.

Anna Maria, a general favourite.	La Tour d' Auvergne, a good variety.
Prince of Waterloo, beautiful variety.	

DOUBLE BLUE.

Albion, very dark, extra large spike, fine.	Laurens Koster, deep purplish blue, well formed spike, fine Exhibition variety.
Garrick, dark shaded blue, full spike, fine.	

SINGLE RED AND CRIMSON.

Circe, shaded carmine and blush, close spike, extra fine.	Solfaterre, extra fine.
La Joyeuse, shaded light rose, fine spike.	Norma, extra fine.
Cavaignac, extra fine, shaded pink.	Robert Steiger, splendid variety.
Neêrlands Glory, extra fine, shaded rose blush, superb spike.	Beauty of Hillegom, extra new variety.
	Madame Hodshon, extra fine, new variety.

SINGLE WHITE.

Alba superbissima, extra fine.	Queen of the Netherlands, splendid variety, with large finely formed pip and close spikes.
Grand Vainqueur, general favourite.	Voltaire, pure white, extra fine.
Grandeur à Merveille, pale blush white, large pip and spikes, extra fine.	Mont Blanc, pure white, large close spikes, fine.
Mary Stuart, extra fine.	

SINGLE BLUE.

Emicus, dark blue, white eye, fine.	Prince Albert, a magnificent dark Show flower.
Grand Lilas, extra fine.	Nimrod, a well known variety.
Orondatus, extra fine.	
Canning, very fine.	

FLORICULTURAL MEMORANDA.

The following Notes have been handed to us by a gentleman of high standing in the Floricultural world. We give them as communicating some of the newest information on the subject :—

Brighton and Sussex Horticultural Society's Exhibition, Sept. 16.
 — The following Seedling Dahlias received certificates :— Mrs Watts (Turner), Marion (Fellowes), Oliver Twist (Fellowes), Venus (Rawlings), King (Rawlings), Jupiter (Rawlings), Queen (Rawlings), and Mrs Hamilton (Dodds). These will be more fully described as the season advances. The show of Dahlias was good ; as, indeed, was the Exhibition as a whole.

National Floricultural Society, Sept. 17.—The chair was occupied by our townsman, Mr J. Downie, of the firm of Downie and Laird. The Censors were Mr J. Downie, Charles Sainsbury, Esq., Bath, Mr J. Pope, Pimlico, Mr T. Moore, Chelsea, and Mr W. Dean, Slough.

A first-class certificate was awarded to *Hydrangea aurea superba* (J. Salter). Certificates of merit to *Dahlias*, Lillie Lund (Burgess), Oliver Twist (Fellowes), Standard Bearer (Alexander), Major Fellowes (Turner), Mrs Watts (Turner), Mrs Pressly (Turner), Jupiter (Rawlings), Mr Pritchett (Rawlings); also to *Achimenes Azurea oculata* (G. Wheeler), and label of commendation to *Dahlia Princess Royal* (J. Salter).

Phloxes—In addition to the names given in our last Number, from the *Gardeners' Chronicle*, the following list has been highly commended, in the same Journal, by Mr James Barnes, Camden Nursery, Camberwell, near London :—

Addisoni,
Alba Magniflora,
Henrincoq,
Josephine Pariot,
Madame Fontaine,
„ Rendlater,
Primulaeflora,
Roi Leopold,

Abdel de Lapinium,
Comte de Chambord,
Imperatrice Eugenie,
Laurence de Cerf,
Madame Delahaye,
Mons. Valery,
Reve d'Amour,

Ericas.—The following new sorts of great merit have been frequently exhibited this season :—*Maidstoniensis* (Epps), *Obbata purpurea* (Epps), and *Tricolor Eppsii*.

DESCRIPTIVE CATALOGUE OF FLOWERS, by John Salter, Versailles Nursery, Hammersmith, London, 1857. LIST OF PLANTS, &c., by E. G. Henderson & Son, Wellington Road, St John's Wood, London.—We regret that, in consequence of an oversight, we have not sooner acknowledged receipt of these two excellent Catalogues. They are so full of novelties that it is difficult to characterise either of them particularly. We commend them both to our readers.

NATIONAL GARDEN ALMANAC AND HORTICULTURAL TRADE DIRECTORY.—We learn from Mr J. Edwards, who was lately in Edinburgh as one of the Censors at our Autumnal Shows, that his Trade Directory will be published as heretofore, on the 1st of January. The extracts made from it in these pages indicate the importance we attach to its general contents. It is alike indispensable to the Amateur and to the Trade at large.

GLEANNINGS.

ALL operation of God is really one; and the yearly awakening of nature in spring is quite as immediate an operation of God, as the first awakening of nature on the morning of the creation.—*Bretschneider*.

Two things fill the mind with ever new and growing admiration and awe, the oftener and more continuously thought is employed therewith—the starred heaven over me, and the moral law within me. Neither of these dare I seek, or merely imagine as veiled in darkness, or as in the expanse beyond my sphere of vision: I see them before me, and connect them immediately with the consciousness of my existence. The former begins with the spot which I occupy, in the outer world of sense, and widens the connection, in which I stand, to unappreciable extent, with worlds on worlds and systems on systems; moreover to the boundless times of their periodic movement—its beginning and duration. The second begins with my invisible self, my personality, and exhibits me in a world which has true infinity, and with which I know myself to be in universal and necessary connection.—*Kant*.

Truth is the law of knowledge. Knowledge is the first groundwork of the spiritual life of man. The idea of truth demands that man gain inner clearness of thought, procure himself insight; and to this cultivation of insight, and to every kind of knowledge truth imparts an immediate inner value, since therein the life of our spirit is fashioned.—*Fries*.

TRUTH.—There are some faults slight in the eye of love, some errors slight in the estimate of wisdom; but Truth forgives no insult and endures no stain. We do not enough consider this, nor enough dread the slight and continual occasions of offence against her. We are too much in the habit of looking at falsehood in its darkest associations, and through the colour of its worst purposes, such as deceit, calumny, and detraction. And yet it is not calumny nor treachery that does the largest amount of mischief in the world; they are continually crushed, and felt only in being conquered. But it is the glistening and softly-spoken lie, the amiable fallacy, the patriotic lie of the historian, the provident lie of the politician, the zealous lie of the partizan, the merciful lie of the friend, the careless lie of each man to himself, that cast that black mystery over humanity, through which, any man who pierces, we thank as we would one who has dug a well in a desert; happy in that the thirst for truth still remains in us, even when we have wilfully left the fountain of it.

Do not let us lie at all. Do not think of one falsity as harmless, and another as slight, and another as unintentional. Cast them all aside—they may be light and accidental, but they are an ugly soot from the smoke of the pit for all that; and it is better that our hearts should be swept clear of them, without over care which is largest or blackest.—*Ruskin*.

WORK.—We are not sent into this world to do any thing into which we cannot put our hearts. We have certain work to do for our bread, and that is to be done strenuously; other work to do for our delight, and that is to be done heartily; neither is to be done by halves or shifts, but with a will, and what is not worth this effort is not to be done at all. Perhaps all that we have to do is meant for nothing more than an exercise of the heart, and of the will, and is useless in itself; but at all events, the little use it has may well be spared, if it is not worth putting our hands and strength to. It does not become our immortality to take an ease inconsistent with its authority, nor to suffer any instruments, with which it can dispense, to come between us, and the things it rules; and he who would form the creations of his own mind by any other instruments than his own hand, would also, if he might, give grinding organs to Heaven's angels to make their music easier. There is dreaming enough, and earthliness enough, and sensuality enough in

human existence without our turning the few glowing movements of it into mechanism.

"Know what you have to do and do it"—is the great principle of success in every direction of human effort; for I believe that failure is less frequently attributable to either insufficiency of means, or impatience of labour, than to a confused understanding of the thing actually to be done; and therefore, while it is properly a subject of ridicule, and sometimes of blame, that men propose to themselves a perfection of any kind, which reason temperately consulted, might have shown to be impossible with the means at their command, it is a more dangerous error to permit the consideration of means to interfere with our conception, or as is not impossible, even under our acknowledgment of goodness and perfection in themselves.—*Ruskin*.

WORK.—There is a perennial nobleness and even sacredness in work. Were he ever so benighted, forgetful of his high calling, there is always hope in a man that actually and earnestly works; in idleness alone is there perpetual despair.

Man, son of earth and heaven! lies there not in the innermost heart of thee a spirit of active method, a force for work; and burns like a painfully smouldering fire, giving thee no rest till thou unfold it; till thou write it down in beneficent facts around thee! What is unmethodic waste thou wilt make methodic, regulated, arable, obedient to thee. Wheresoever thou findest disorder, there is thine eternal enemy. Attack him swiftly; subdue him.

All true work is sacred; in all true work, were it but true hand-labour, there is something of divineness. Labour wide as earth, has its summit in heaven. Sweat of the brow, and up from that to sweat of the brain, sweat of the heart which includes all Kepler calculations, Newton meditations, all sciences, all spoken epics, all acted heroisms, martyrdoms.—*T. Carlyle*.

IDEA.—Let the idea of what we want penetrate us, and it will be a self-fulfilling prophecy of what we shall have.—*Anon*.

THE DOMINANT.—As something must always step into the place vacated by any authority or power, so when that which ought to be dominant is not there, that which ought not to be dominant must be there.—*Anon*.

EXTRACTS FROM THE PROCEEDINGS OF THE NATIONAL FLORICULTURAL SOCIETY.

At a time when so much interest is exhibited in Seedling Flowers, and novelties in horticulture generally, we feel that our readers cannot be better supplied with current information relating thereto than from the published reports of the Society mentioned above. From these reports we propose from time to time to give copious extracts. The Society and its functions we shall take an early opportunity of considering, in the assurance that, to the cause of Floriculture, such a tribunal is extremely important and advantageous. Meanwhile, we learn with satisfaction that it is not without its admirers and supporters in this locality.

At a General Meeting held on Thursday, March 26th, 1857, Mr James Cutbush in the Chair, the Censors, Messrs Robinson, G. Smith, E. Sanderson, and T. Moore, furnished a report of the following awards to seedlings:—

First class certificate to *Cineraria*, Regalia—Habit first-rate, truss good, flowers somewhat reflexed, size full, substance stout, colour bright crimson-lake self with grey disc, of a most showy character; from Mr Turner, Slough. Certificates of merit to the following:—*Cineraria*, Mary Queen of Scots—Habit medium, truss good, form good, size full, substance moderate, colour pure white ground, well-defined bright rosy purple tips, disc too small to be in good proportion; from Mr Sharman, Dulwich. *Cineraria*, Prince Albert—Habit good, truss good, form and substance both commendable, size above average, colour white ground with rosy purple tips, disc dark maroon, very prominent; from Mr Turner, Slough. *Cineraria*, Prince of Wales—Habit

very good; this was produced in a condition to justify the award formerly made; from Mr Turner, Slough. *Cineraria*, Lady Palmerston—Habit good, truss good, form good, size large, substance moderate, colour pure white with rosy purple tips, disc dark and bold; from Mr Sharman, Dulwich. Forcing *Pelargonium*, *Blanch-fleur*—this more than maintains its character as an early flowering variety, and reported on at a previous meeting; from Messrs Braid, Hendon. *Camellia*, *Christiana*—Habit good and bold, as is its foliage, form hemispherical, size full, substance stout, petals pointed, imbricated, and with a strong tendency to assume hexagonal arrangement, colour deep salmon pink, veiny; from Mr Turner, Slough. *Azalea*, *Queen Victoria*—abundant bloomer, colour white, with narrow flakes of purple; from Mr W. Ivery, Peckham. *Azalea*, *Queen of Whites*—Habit dwarf, compact, and free, segments broad and even, size rather large, stout, white with a dash of green on upper segments, which with age it is expected will become bleached; from Messrs Ivery & Son, Dorking.

AZALEAS.

Mr Todman, of Clapham Park, sent *Clapham Beauty*—Deep rose pink; well formed and of good substance; will probably prove a meritorious variety of the light red class.

CINERARIAS.

Mr Turner, of Slough, exhibited the following:—*Queen Victoria*—Flowers large; white, the florets tipped with a delicate lilac-tinted rose, the zone of white surrounding the pale purple disc broad, clear, and well defined: an attractive flower at first sight, but proving deficient in the form and arrangement of the florets, which, moreover, reflex; it is, however, as a yearling, a flower of promise. *Rainbow*—Purple, with a red zone around the disc. *Lord Palmerston*—Dark purple-rose; broad florets. *Delight*—Large, white, with heavy tip of rose purple; pale disc.

Mr Sharman, gardener to C. Ranken, Esq., of Dulwich, sent *Eclipse*—Purplish-rose, with zone of white around the purple disc.

Mr Gooch, of Clapham Park, sent:—*Conspicua*—Rosy-purple, with small zone of white. *Defiance*—White, with heavy tips of rose-purple; large, with incurved florets forming a cup, but loose. *Symmetry*, *Mrs Cubit*, and *Formosa*—White, variously tipped with rosy purple.

Mr Bousie, of Stoke Park, near Slough, sent:—*The Pet*—Deep blue purple, with pinkish zone around the disc. *John Edwards*—Dull purple rose, slightly starred with white around the disc; of fine form and good habit; shown last year.

Mr Bra g, of Slough, sent:—*Colonel of the Blues*—Blue. *Pet*—White, tipped with rose.

Messrs F. & A. Smith, of Dulwich, sent:—*Magnum*—A variety of much promise, yet produced in a very imperfect condition as to cultivation; colour white, with heavy purple-crimson tips and dark disc; the flowers large, and both richly coloured and showy. *Sarah* and *Oleopatra*—White, tipped with rosy purple. *Louisa*—White, with purple tips. *Lord Palmerston*—Dark purple-rose.

MISCELLANEOUS.

Messrs Henderson & Co. also exhibited a good plant of *Acacia Drummondii* and some other stove and greenhouse plants.

SHADE-HOLDERS.—Mr G. Hiley, of Mossley, exhibited a very simple and apparently efficacious support for the shades used for florists' flowers. The shades themselves may consist of any convenient tin canisters inverted, and with an aperture cut in the upper side for ventilation; one side of these is tacked to the hollowed side of a piece of tough wood; the wood has also a square notch cut away to receive the stake, against which it is firmly held by means of a simple iron thumb-screw.

MOVEABLE PLANT STAGE.—Mr Robinson, of Pimlico, exhibited a model of his Moveable Plant Stage, the object of which is to elevate or lower at will

the whole of the stage of a greenhouse, together with the plants, and to fix them at any desired distance from the glass. The utility which will mark this contrivance, when it has been put to the test of practical experiment, must be obvious to those familiar with plant cultivation; since not only may the plants be brought up, if desired, almost in contact with the glass during the day, but they can be lowered to any safe distance from the glass during frosty nights, or they may be lowered to facilitate watering, and other necessary operations at any time. There are two plans proposed. One acts by means of compensating balancing weights; in the other and more useful plan the stage is moved by means of a windlass and pulleys. It is stated that the weight of the plants is no obstacle to the application of the contrivance, which Mr Robinson has patented.

At a general meeting held on Thursday, April 23d, 1857, the Censors, Messrs Ivery, Keynes, Hall, E. Sanderson, and T. Moore, furnished a report of the following awards to Seedlings:—

First Class Certificate to *Cineraria*, Baroness de Rothschild—Habit undeniably first-rate, truss full and freely expanded, form, size, and substance each first-rate, colour white ground, very distinctly laced with clear pale purplish rose; from Mr C. Turner, Slough. Certificate of Merit to the following:—*Cineraria*, President. Habit and truss but middling, form and substance good, size large, colour white ground, deeply tipped with purple crimson, disc large and fine, plant needing age; from Mr Sharman, Dulwich. *Cineraria*, Mrs Colman. Of first-rate habit and good truss, form middling, size full, substance stout, colour white ground, much tipped with shaded puce purple, of a new shade; from Mr Turner, Slough. *Cineraria*, Mrs Hoyle. Habit good, truss fine, colour white ground, tipped crimson purple; from Mr C. Turner, Slough. Label of Commendation to *Cineraria*, Miss Harriet. Desirable for conservatory or market purposes; from Mr Whiting, Deepdene, Dorking.

AZALEAS.

The following were exhibited by Messrs Jackson & Son, of Kingston:—*Lady Lambert*—A well formed and promising flower, lively rose colour, strongly blotched on the upper segments. *Rosea grandiflora*—Large, but loosely formed; rose coloured. *Lateritia perfecta*—Small, and too narrow in the segments; dark salmon red. *Snow flake*—White, with a green tinge on the upper segment.

AURICULAS.

The following was exhibited by Mr Betteridge, of Abingdon:—*Brutus*—A bold flower; the expanded segments dark mulberry purple, forming a broad zone surrounding the creamy or greenish centre.

An interesting and finely grown collection of Auriculas was exhibited by Mr Turner, of Slough, including such as *Othello*, *Mary Gray*, *Bessy Bell*, *Glory*, *Countess of Dunmore*, *Champion*, *Ringleader*, *Perfection*, &c.

CINERARIAS.

The following was exhibited by J. H. Hedge, Esq.:—*Laconia*—White, tipped with rosy purple; the florets open,

Mr Turner, of Slough, sent:—*Admiral Lyons*—Attractive and somewhat novel in its colour, which is a lively rose purple, relieved by a narrow white zone around the gray disc; of medium quality. *Pauline*—White, heavily tipped with dark blue purple. *Lady Gertrude Vaughan*—Large, and rather loose; heavily tipped with purple crimson.

The following was exhibited by Mr Heath, of Cheltenham:—*Lady Ramsay*—Large, the florets open; white, tipped with rosy lilac.

The following came from Mr Rogers, of Uttroter:—*Wonderful*—A clear rose self, large and bold, but somewhat coarse. It may, however, when more advanced, prove a showy decorative variety. *Success and Glory*—Smaller and inferior flowers, of the same colour as *Wonderful*. *Tom Thumb*—Small; lilac. *Admiration* and *Miss Humphries*—White, with blue tips.

The following came from Mr. Sharman, of Dulwich:—*General Codrington*—White, deeply tipped with rich crimson purple. *Bob in a Ring*—A small plant and weak, but promising; florets even, forming a concave centre; rosy purple, with a very distinct and clear narrow zone of white around the purple disc.

The following was from Mr G. Smith, of Hornsey:—*Climax*—Compact habit; rosy purple, with a zone of white around the disproportionately large dark disc.

The following was exhibited by Mr Pope, of Chelsea:—*Eminent*—White, tipped with light purple; showy, but the florets rather open and notched.

PANSY.

The following was exhibited by Mr Bragg, of Slough:—*Phyllis*—Dark purple, yellow ground, with feathery eye.

A FEW GLEANINGS FROM BASING PARK.

This beautiful country residence of Joseph Martineau, Esq., is situated about eight miles from Alton, which now forms the termination of a branch line from Guildford on the London and South Western Railway, the train whirling the traveller within a short distance of Aldershot, and amid the rich scenery, the fertile lands, and the flourishing Hop grounds of Farnham.

APPROACHES.—At the gate which admit the visitor from the Alton road a beautiful lodge is situated, harmonising with the style and character of the mansion. These gates, as they always ought to do, but in such an exceptional case as that at Wrotham Park, alluded to the other week, are placed at right angles with the highway. The approach within is distinguished by the ease and gracefulness of its curves, and is as trim and neat as most walks in a pleasure ground; just rounded in the slightest degree in the middle, and the gravel at the sides within half an inch of the grass verge. On the other side of the demesne, joining, I believe, the Winchester road, a new approach has been formed, the lodge being of less pretending character. This approach mounts a steep ascent, but the steepness is greatly lessened by the graceful curvatures and line-of-beauty windings with which the artist has taken the road up the hill. This new approach will, in time, be one of the most striking features of Basing Park. Along its side a double avenue is formed of strong Deodars and Araucarias, the latter being next the approach, and standing about forty feet apart, the Deodars not being opposite to, but in the centre between each two Araucarias, and at a similar distance from each other. Each tree is protected by a round wattled fence, which has kept the plants from all injury. Such an avenue would be interesting in any circumstances, but I believe that a diversity of light and shade will be found, some years hence, from the windings of the approach, that no straight avenue could command, even with such materials as Araucarias and Deodars. In producing effect and ornament it may be well worthy of inquiry whether certain forms of vegetation that are extremely interesting when looked at in a curved, ever-varying line, do not become monotonous and insipid when looked at along a straight one. As an instance of illustration from the flower garden, take the finely-cut, silvery white foliage of the *Cineraria maritima* when used as an edging, and mark the difference when that edging is in a straight and a curved line.

EVERGREEN GARDENS.—There did not seem to be any extra extent of mown lawn here—a matter of great moment in laying out new places, as every yard of that lawn is just so far a sacrifice of utility to ornament, and an ornament the most expensive of all about a garden, because to keep it as an ornament it requires a similar amount of unappreciable labour every week in the summer months. One reason urged in behalf of extensive lawns, even by those who do not aspire to their ever-so-many acres of green turf without a shrub

or tree to relieve the eye, is, that otherwise they could have no chance of congregating around them those beautiful forms of evergreen vegetation that by their diversity lend such a charm to the ornamental grounds. Mr Duncan has hit upon a happy mode of securing that ever-growing interest without any great sacrifice of utility or economy. In the thinnish part of a wood separating the different gardens from each other he has planted various evergreens, such as the best *Rhododendrons*, *Pinuses*, *Cypresses*, *Junipers*, *Thujas*, *Biotias*, *Taxodiums*, *Cryptomerias*, *Deodars*, *Araucarias*, &c., so that each will have ample space to grow and develop its respective beauties. Access is easily obtained to any specimen, the grounds being traversed by narrowish winding walks, which cross each other frequently at right angles. An additional interest is given to these points of juncture by a circle being formed there considerably elevated in the centre, and having planted there one of the more esteemed or rarer kinds, such as *Cupressus funebris*, *Hellingtonia*, *Fitzroya Saxæ Gothea*, &c. These circles not only produce variety, but do away with the sharp corners of two walks crossing each other. The ground between the specimens is chiefly covered with low growing evergreens, such as *Berberis aquifolia*, &c., which will not only save scythe work, but prove an excellent cover for pheasants and other winged game. In this same wood are some fine deep ravines and dells, in which Ferns and rock plants would find a suitable home.

RENDERING LOOSE-GROWING EVERGREENS COMPACT.—I was struck, not so much here as in the different flower gardens, with the compactness and symmetry of many plants that generally grow rather loose and straggling, such as the *Taxodium sempervirens* and *Cryptomeria Japonica*. This is effected by pinching off the ends of the young shoots, and so effectual has been the result that almost every specimen had a close, trim appearance, and yet not so much so as to conjure up any idea of a cutting or shearing process. *Junipers*, *Cypresses*, &c., had been so treated, and yet beyond their compact outline they contained no trace of the artist's work. A stranger, not knowing anything of the process, would give all the credit to some peculiarity in the soil, position, &c.

DIVERSITY IN STYLE.—Near the mansion and conservatory are three small flower gardens, each different in style, and yet arranged on one distinct principle, and that different from that which is now generally in fashion. For instance, in one garden the clumps are separated from the gravel by narrow green verges of grass about one inch in width, which look very neat, and are quickly trimmed by holding the shears in a slanting position. The one principle of action in all these gardens, however, has been not so much a great blaze of level colour in summer as an interest and an elegance every day of the year. The flower beds are laid out in groups, but not large, and are blended and surrounded with such plants as noble *Araucarias*, beautiful *Schubertias*, elegant *Cypresses*, and massive *Rhododendrons*. The blaze of mere colour in the beds can hardly ever dazzle and pain the eye, from the many tinted green shrubs in their vicinity; whilst these shrubs again reflect back the beauties of the flower-beds, a matter to which I have frequently alluded. The different heights of the shrubs, as also of the plants in the flower-beds, give a light, airy appearance to the whole, in unison with a great variety of tints and lights and shades. This effect is also added to by the mode of planting the beds in groups. Most of these are of one or two colours, after the mode usually adopted, but some are filled with a mixture of showy herbaceous plants of different heights and colours. Though practising the grouping system largely, it is well known that I am not insensible to its defects. The somewhat level, carpet-like appearance of the beds is one of these. The want of a various-tinted green back-ground is frequently another. The monotonous sameness, from the level uniformity and want of light and shade, even though the beds have great variety as contrasted with each other, is another defect. Hence large standard and pyramidal plants, contrasting with the colour of the bed, have been recommended for relieving the level monotony. Hence Evergreens have been commended as stand-

points and backgrounds. Hence vases and statuary have been spoken of as reliefs to the sameness produced by a level variety. But, as here at Basing Park, such artistic ornaments, and such more natural decorations in the way of fine shrubs, must stand out free, distinct, and unencumbered, from their base to their summits. Then the flower bed and the shrub and vase will lend and receive additional attraction from each other. Surround a pedestal or a Deodar with a belt of flowers, and you mix and mingle to the confusion of the ideas of order and fitness. Place such objects apart, distinct, and yet sufficiently near each other to combine, and, whilst each is beautiful contemplated separately, they unitedly form an harmonious unity. Sorry should I be to witness the wreck of the gorgeousness of the bedding system. It will have a better chance to live if combined with fine evergreen specimens, and if the groups themselves are not over large. The outline of the small beds would, even if unfilled in winter, present an artistic appearance in contrast with the green shrubs. They would be more interesting still filled with early bulbs, Primroses, and Polyanthus, as is done, I understand, at Basing Park. I have, at various times, somewhat timidly given utterance to such opinions; but I should have had less shrinking in moderating the overflows of a popular current had I visited Basing Park earlier, or seen the unique, beautiful grounds of the venerable Dean of Winchester at Bishopstoke, which are arranged upon a somewhat different principle, the chief difference being that, at Basing Park, the flower beds are arranged in groups, whilst, with one or two exceptions, this has not been deemed necessary at Bishopstoke. —R. Fish, in *Cottage Gardener*.

CALCEOLARIAS.

WITHIN the last few years these have improved greatly both in form, size, and colour of marking. We now, in fact, possess an endless variety of them. Many are, however, scarcely worth cultivating. People must, therefore, use some caution, if it is intended to make a judicious selection. The Calceolaria is considered by some difficult to cultivate; this is, however, a mistake, for with attention there is scarcely any florist flower easier to manage. The grand secret in growing it is to keep the plants tolerably dry in winter, and well protected from frost, with as little fire-heat as possible, and during the summer months to supply them liberally with water, and keep them well shaded from the scorching rays of the sun. The plants may be grown successfully in frames placed against a wall with a south-east aspect, the front and ends being glass if possible, as well as the top. Let the roof lights lift up instead of sliding, so as to admit air in wet foggy weather, and at the same time exclude rain. The frames, if possible, should be elevated on brick work about 2 feet or more, in order to show off the plants when in bloom to greater advantage, and it is also a more convenient height for watering and general management.

In all cases let the plants be as low and bushy as possible and well rooted. Let them be shifted into 4-inch pots in compost consisting of one-third good friable loam well rotted from an old pasture, one-third peat or heath soil, and one-third leaf mould, all well mixed together with a quantity of silver sand. Let the drainage be efficient, or even under the best treatment failure will be the result. If new varieties are required let them be obtained as early as you can in autumn.

During winter the plants need but little water; but they must be kept from flagging; all decayed leaves should be picked off, and the plants should be protected at night by covering with mats. Of course a hot-water pipe run round the pit will be required in severe weather. If by accident the plants should, however, happen to get frosted, keep them covered up for a few days and expose them cautiously to sunlight; if not too much injured they may recover. About the last week in February they in general begin to exhibit

signs of growth; then repot them into one-fourth leaf-mould, and one-fourth good rotten cow or horse-dung with loam and sand as before. During the two succeeding months, March and April, continue to repot them according to their growth, until they are in the pots in which they are intended to bloom. About a month before they come into flower a little clear guano water may be given them, say twice a week; this will be found to improve the bloom. In May and June they ought to be in full beauty.

After they have done blooming cut them down, topdress, and remove them to a shady situation, supplying them liberally with water, where they will soon push side shoots, which should be taken off when about 2 or 3 inches long for cuttings. In September offsets and cuttings may also be obtained and struck in the usual compost, but with more silver sand in it. Insert them about 2 inches apart in wide-mouthed pots or pans, and if a bell-glass is placed over them they will strike all the sooner. After the cuttings are well rooted place them in 4-inch pots, as already recommended, and by proper treatment they will make fine blooming plants the ensuing spring.

As regards sorts, handsome though many of the herbaceous *Calceolarias* may be justly considered, they are fast giving place to the shrubby kinds, which are if possible more profuse flowerers, hardier, and therefore more easily managed. Of the latter the following are 12 of the best, viz. :—

Orange Boven.

King of the Yellows.

King of Sardinia (crimson).

Gem (yellow with brown spot).

Yellow Prince of Orange.

Beaut of Montreal (light crimson).

Orange Perfection.

Eclipse (crimson scarlet).

Hawk (orange spotted brown).

Yellow Dwarf.

Heywood Hawkings (orange brown).

Aurea floribunda (yellow).

Of these the last six are most suitable for pot culture.—*M., in Gardeners' Chronicle.*

CUPRESSUS FUNEBRIS.—The funeral Cypress, “the most beautiful tree found in the tea-districts of China,” says Mr Fortune, “is this species of weeping Cypress.” The first specimen of this noble-looking Fir tree, which he discovered in the year 1844, was about 60 feet in height, having a stem as straight as the Norfolk Island Pine, and weeping branches like the Willow of St Helena. “In a few years,” says this distinguished traveller, “we may expect to see a new and striking feature produced upon our landscape by this lovely tree, when its wood has been well ripened and matured.” It has proved to be *hardy*, and is a fit companion for the *Cryptomeria Japonica* and *Cedrus Deodara* in our parks and pleasure-grounds.

MILDEW IN PEAS.—A practical gardener, Mr J. Robson, gives his opinion as follows, in a late number of the *Cottage Gardener*:—The disease on the Pea arises, I think, from the plant being grown at an unnatural season. Nature's object in directing a plant to grow, ripen its seed, and re-produce itself, is generally accomplished without any further detriment from insect or disease than is necessary to maintain that just balance of things so beautifully arranged by Divine economy; but Peas and many other crops are attempted to be grown under circumstances so widely different from those to which they were accustomed in a wild state, that disease or delicacy need not be wondered at. Now, in my opinion, the cause of mildew in Peas arises from the plant being unable to obtain a due supply of proper food, or, where it does so, the leaves of the plant, which are properly designated its lungs, are not in a healthy state to act upon it. Hence the plant becomes a victim to disease from two opposite causes. The first of them is, Peas being carried off by mildew in dry hot seasons on dry, gravelly, or sandy soils, where the plant is denied the liquid food necessary to its growth; and, in the second case, the food supplied exceeds the capabilities of the plant to properly digest it. The lack of sunshine or other genial warmth paralyzes the plant, and it falls a prey to mildew.

VARIETIES OF FRUIT WEARING OUT.—Without presuming to teach or explain the phenomena complained of, we prefer learning some understood laws under which they are controlled, so as to enable us to reason intelligently, if by such means we could arrive at an understood conclusion. We have outlived various prophetic predictions arising out of discussions and conclusions during the last 30 years, which leaves us yet in the rudiments of investigation regarding the degeneracy and extinction of various varieties of fruit. The Flora of a country changes when the circumstances under which they were established are changed; plants thus become extinct, while other plants take their place, arising from the circumstances being favourable for their development. Various plants are of general distribution, and circumstanced to grow under a variety of soils and situations, while others are local in their distribution, and confined to certain soils and situations. The florist in pursuance of these investigations prescribe certain circumstances under which they grow the various classes of plants under their care, which is attended with considerable success by applying this test to the varieties of fruit now under review, and class them as plants that have proved themselves unsuitable for general distribution throughout the varied circumstances under which they have been placed. It becomes us then to enquire if they are not to be found established in local habitats, possessing all the requirements of vigour and fruitfulness; we would thus learn from such a discovery something of the circumstances under which they are found, and thus be enabled more intelligently to grapple with the subject.—C. H.

THE JERUSALEM ARTICHOKE MARROW.—Those who have studied the properties of the various kinds of Gourds, Pumpkins, VEGETABLE MARROWS, Squashes, or by whatever other name such esculents may be known, are aware that one of the best for the table is that called the *Patisson*, or *Elector's Cap*, or sometimes the *Jerusalem Artichoke Marrow*. It is remarkable for its depressed spherical form with a deep equatorial rim divided irregularly into round knobs. Pale green, under, agreeable to the taste, and an excellent recipient of sauce, it has always stood in the highest class of eatable Gourds. But it is a SQUASH, that is to say, a large coarse bush-like Gourd, which does not run along the ground, and in this country at least is so very bad a bearer that it is seldom seen in cultivation. There is however now growing in the garden of the Horticultural Society a Gourd, whose fruit is of the kind here described, with all its excellent quality, but which *does* run, and bears most abundantly. Seeds were sent to the Society by Mr Thomson, Gardener at Dyrham Park, under the name of the "Custard Vegetable Marrow," and we understand he intends to offer seed for sale in the ensuing winter. In the axil of every leaf is a fruit, and there seems to be no other limit to productiveness than the arrival of frost. The cut given shows the natural size of the fruit when fit for table, and it will be evident the mere beauty of its form would render it better adapted to a side dish than the common Vegetable Marrow, even if it were not superior in quality and more abundant in produce.—*Gardeners' Chronicle*.

SEEDLING APRICOTS.—The generality of Apricots formerly cultivated in this country had bitter kernels, the Breda and Turkey forming the only exceptions worthy of notice. But besides the two just named, there must now be included in the class of sweet-kernelled Apricots the Musch-Musch, originally from the oases of Upper Egypt, the Syrian Apricot Kaisha, and we believe some others introduced into this country by the late Mr Barker, of Suedia. We have now to add another, a seedling raised by M. de Jonghe, of Brussels, who has kindly sent us a branch of it about three feet in length from a tree growing as a standard. On this length of branch we counted *upwards of six dozen fruits*, notwithstanding the unfavourable spring. There can therefore be no question as to the productiveness of the variety. The fruit so crowded could not of course be large, but if properly thinned it would have probably equalled in size the Breda, which it also resembles in form.

The skin is brownish-orange; the flesh is deep orange, parting freely from the stone, exceedingly juicy and rich. The stone is small, roundish, and contains a sweet kernel. The fruit is excellent for the dessert, and makes, we can add, a rich preserve. Specimens of another seedling were received with the above, but not at all to be compared with it in point of flavour; the flesh was not so juicy; kernel bitter.—R. T., in *Gardeners' Chronicle*.

APPLES AND PEARS IN THE PRAIRIES.—Mr Ellsworth of Napierville informed me that Apple trees thrive well upon the prairies, but that they require to be well cultivated for six or seven years when planted. Thus it seems that the fertility of the soil does not make up for its peculiar physical condition, because if mere fertility had only to do with the matter, it is altogether a mystery why the granites and sands of New England are so productive under Apple orchards which are neither tilled nor manured, and yet are so unproductive under grain crops. Peach trees do not bear well on the prairies. The reason assigned is, that the blossom comes out too soon in spring, and is destroyed by the late frosts. One farmer told me that they grew so rapidly that the winters frequently killed them. I could also believe that the constitution of all trees that grow upon the "mucky" soil of the prairies must be weaker, and therefore more liable to suffer from intense frosts, than those that grow upon sounder land.—*Ibid.*

HIBISCUS SYRIACUS.—*Spiræa callosa* is certainly a very pretty shrub, and flowering as it does at a time when our shrubberies have lost much of their attraction, it is a valuable acquisition, but when it is said to be the most valuable and showy flowering shrub of the month, I looked at my favourite *Hibiscus syriacus* and said—"No." True it was, the season was an early one, but there was the *Althæa frutex* radiant in its own beauty, and though not fully in bloom, yet enough flowers were expanded to throw any of the beautiful family of *Spiræa callosa* not excepted, into the shade. But now another month has passed, and a glorious floral month it has been, this August but even now just passed, and day by day my beautiful *Althæa frutex* became more and more beautiful, and even now, the 7th of September, although somewhat dimmed of their pristine splendour, are still most attractive. What think you, readers, of plants that have produced from 500 to 1000 blooms, measuring from 2½ to 4 inches in diameter? Can any *Spiræa* vie with these? Then again there is no diversity—it is *Spiræa callosa* for ever, but a group of seedling *Hibiscus* well selected is as varied as it is distinguished. Remarkable, indeed, are their variations in colour, ranging from pure white to pink, red, crimson, and purple, and these again diversified with deep blotches or with long clearly-defined lines of a deeper tint, commencing below and terminating half up each petal, where we lose it in the soft colouring of creamy-white, the shaded pink, the glowing red and crimson, or the deepened purple, thus giving two series of the same colours—the one with lines and blotches, and the other with deep and well defined spots only. But we do not end here, for what we have spoken of are all single, and suit the purer taste of the botanist, but, as well, the florist may find interest, for there are several variations possessing double flowers, and these latter blossoms last for a longer time than their single derivatives—a matter of no small import when flowers in the shrubbery have become scarce, and when for colour we have to press into our service the coral berries of the Mountain Ash, the red Elder, &c., not to speak of the Thorns that again brighten our shrubberies with their berries, as in May and June they did with their blossoms. Apart from all banter, in truth and in verity I have always loved the *Hibiscus syriacus*, and have in my time raised thousands of seedlings from seeds collected in South Carolina, as well as those collected in the Holy Land and at home; and curious it is to see that from each locality there appears to be produced two strains originating from leaves that in one instance are obtuse, producing generally purple and crimson varieties, and in the other elongated, which usually produce the pink, the Painted Lady, and the like tints of colour. In this particular the varieties are as well marked as the two kinds of Thorns

in our Quickset hedges. If I can but succeed in enlisting those who read this into my service, and be the means of introducing more liberally the variations of the Hibiscus into plantations, I am sure I shall also increase greatly the enjoyment of the garden in the month of July occasionally, but in most years of August and September, and then there will be also ample room for the pretty Spiræa in its season.—WILLIAM MASTERS, Exotic Nursery, Canterbury, in *Gardeners' Chronicle*.

SHOWING OF DAHLIAS.

Notwithstanding all that has been written on this subject in the *Horticultural Journal and Gardeners' Gazette*, and twenty years almanacks, it tells but little on exhibitors, who often lose two or three points by a bad choice of flowers and a still worse arrangement. We ought to refer people to those works, instead of so often repeating what every grower ought "to know by heart." Without, however, repeating our lessons *in extenso*, we will repeat the principal hints, and leave our readers to profit by them as far as they can, and turn to the works in question for further information. First, then, we recommend young exhibitors to cut the flowers that are most perfect, that is to say, with centres as full up and outlines as fine as they can find them, without regard to colour or size. Of course, among these there will be some large, some middling, and some even less than middling, therefore the next thing is to divide them into the three sizes. Beginning then with the largest that are perfect, they must begin with the back row. If they can, they should put the best two light ones at the top corners, and the best two dark ones next to them, working towards the centre. The next two must be the next best light ones they can produce, and the next best dark ones in the centre. They may then look to the middle row size, and put the best two dark ones at the two ends, under the two top corners; two light ones next, under the top dark ones; then two other dark and two light ones in the centre. The bottom row is done after the plan of the top, and when these are all arranged, look among the spare flowers, to see if any are better than you have already placed, but be careful that you have no duplicates, because two of one sort disqualifies the stand. It is just possible that you may be deficient of light or dark flowers, and unable to carry out the plan to your liking. In this case, see if you can mend matters by putting larger flowers in the second or third row, instead of carrying out the three sizes complete, remembering the four corners are always the more striking when light. Again it may be that light flowers are scarce; you must then substitute the brightest. Now whites, edged flowers, lilacs and yellows, and even orange colours, may be fairly used as light. Next to these, bright scarlet may be so appropriated; but purples are all dark, and heavy crimsons; and even when a majority of dark flowers prevent us from doing as we wish, still a great deal may be done by uniformity of arrangement, not to have two dark ones together, except in the centre, nor two light ones. When they all run too much of one character, there will be shades of difference to enable us to do something towards uniformity. A stand of twelve must be done in the same way, keeping the outsides, in the top and bottom rows, as light as we can, and the centres as dark as we can, and the middle row reversed. We are quite sure that uniformity in a stand is a strong point in its favour, and judges, if they do their duty, are bound to notice it so far that when two stands are equal in other respects, the stand properly arranged should have the benefit. Simple as this may seem, let any one go over a number of stands, in an extensive show, and he will see more than half of them set up without the slightest attempt at arrangement, and many a stand of really good flowers spoiled by a total disregard to any kind of contrast—one end of the stand, perhaps, with nearly all dark, and the other light, or otherwise the effect spoiled by a bad disposition of the flowers.—GEORGE GLENNY, in *Midland Florist*.

THE MANAGEMENT OF FRUIT TREES.

[We give the following sensible letter from the columns of an Irish contemporary. We do not perhaps concur in every statement which it contains; but we agree in the main, and we are sure that our readers will be pleased with its vigorous style of thinking.—Ed. S. G.]

In continuation of the subject under the above heading, my remarks will chiefly be confined to the system of planting and treatment of trees, which I observe has been practised in this part of the country, together with a few practical hints on approved principles of planting standards, either in a kitchen garden or orchard. We will take for example, a newly formed garden, or the renovation of an old one, and which, of course, must be planted with its Apples and its Pears in lines along the walks, and liberally through the flats. The planting of fruit trees along the walks of a kitchen garden is the grand and popular error, committed almost universally by every one who has had his finger in the formation or planting of a garden; but which ridiculous and untasteful practice is exploding in a ratio equal to the tidal advance of the science of horticulture.

The object of this *sine qua non* system of planting seems to be that a person passing along the walks, may conveniently look at and admire them. This answers very well for a time, while the trees are young; but in a very few years the trees get up, their branches intercept the free passage along the walks, the flowers or culinary crops, which (while the trees are young) adorned the side borders, are seen no more in the same flourishing condition, but ruined either by drip or shade; thus the parts of the garden which ought to form the principal promenade of the family, is become deserted ground, and other more open and airy fields resorted to instead.

We admit that the trees for a number of years are very interesting. The fruit is good and plentiful, but the trees finally become large, the ground has been cropped year after year underneath and around them; and in a most indiscriminate way I observe the workmen have, whilst digging, taken their full depth of spit unscrupulously up to the very bole of the tree. This together with their being too deeply planted while young, is most barbarous treatment. The consequence is, they not being allowed to work nearer the surface are compelled to work deep, and this occurs in many instances, where the substratum is not of the most genial kind, ramifying perhaps in a cold clay, or in an equally unkind gravel, both inducing canker, and prejudicial in every way to the healthful development of the trees.

The pruning of standard fruit trees has hitherto been very little understood, at any rate very sparingly practiced in this locality, which also tends materially to the premature decay of the tree, the trees having become so top heavy, and wrought upon by every prevailing gale, that to maintain their gravity, they naturally strike their roots both outward and downward. This is the time that the trees get out of bearing, as may be observed by parts of the trees becoming cankered and dead, whilst other parts are making the most luxurious growth, and a time which in other circumstances would be the zenith of their lives for health and fruitfulness, is instead a time of mortal struggle for life or for death; the latter generally coming off victorious, at least so far as fruitfulness is concerned.

At this stage a change of gardener is thought advisable (*a commodity which like every other, can be had in gradation of quality, according to the quarter procured from, and the price paid for*), and by whose hobby, let it be a good one or a bad one, the proprietor and his trees must be treated accordingly. The latter are now mutilated and amputated to such a degree, that instead of what might have been a neat, novel orchard, studded yearly with the finest of fruit, is now nothing but a wreck of dilapidation and stumpery. A pretty dilemma to be in! When we reflect on the time this has been coming about,

and the distant prospect there is of arriving at that picture of perfection which I shall endeavour to describe, and which may be looked upon by the sceptical and unskilled as impracticable—an inexperienced idea, licenced only by poetical fancy.

Let the trees be procured grafted on the *Crab stock*, or on the *free stock*, which latter is procured from sowing the seed of the most vigorous and upright Apple which is cultivated for fruit, and is less liable to be so subject to canker, as those wrought on the Crab or paradise stock. If Pears, let them also be had on the *free Pear stock*. The gross error of having them on the Quince is now exploding, and used only for checking the growth of the stronger varieties, such as *Marie Louise*, *Williams' Bon Chretien*, *Louis Bon of Jersey*, *Beurre de Rance*, and *Van Mons Leon Le Clere*.

If lines are to be planted along the walks, let them be at distances of from twelve to fifteen feet, and from eight to ten feet in the line. Prepare pits for them by digging out the garden clay (if bad), to the depth of two feet and a-half and five feet wide, filling in fifteen inches of good fresh turf from a meadow. The upper fifteen inches may consist of the same turf, which had been decomposing in a heap for about a year, mixed with a little well-rotted dung, leaf soil and sand. In this the tree will feel at home. Let the tree be planted in a straight line parallel with the walk, and in the centre of each pit. They may be trained as cups or handsome pyramids; or a cup and pyramid alternately has a good effect, the cup tree attaining the height of about five feet, and the pyramid from six to eight. The method of training both styles is simple, and which I will give, according to the *modus operandi* I have been accustomed to. For the cup style, let the young plant one year from the graft, be headed over one foot above the graft, and as many side shoots encouraged as can be got. These train horizontally, and attach to a wooden hoop, which circumscribes the stem, at two feet of a radius. Six upright posts are inserted round the hoop, to the required height of five feet, and other circumscribing hoops fastened to these at convenient distances. The main shoots, which radiate from the stem of the tree, are brought up the posts, and their laterals trained horizontally. Thus by vertical and horizontal training, the mechanical training of the cup is completed, perfect in beauty and symmetry. The tree by this method of training is fully exposed on all sides to light and air, and being uniformly studded with fruit-bearing spurs, presents from the season of blossom to the season of ripening the fruit, a most imposing object of beauty, novelty, and economy.

The training of the pyramidals is simple, all that is wanted in them is to encourage a main stem, and tie down their laterals in tiers from 18 inches to two feet apart.

The dwarfing of the trees on the Pear stock for this purpose is effected by biennial root-pruning. The caroty roots are cut, which operation produces a quantity of small fibre, some of which will again in a couple of years become strong, and must be cut a few inches in advance of the previous cutting. This produces a ball of matted fibre, and effects the check of the luxuriant growth, which by neglect and natural causes, would only encourage the trees to an exuberant growth, getting for a time out of bearing, and ultimately in many cases ending in canker.

The system of root-pruning now so generally adopted and approved of, and when properly understood, gives the cultivator the swaying balance of power between the root and the top, and holds in his hands, as it were, the vital reins of the plant, and can at will effect the system of training with profit which I have been endeavouring to describe.

Trees wrought on the Quince stock come sooner into bearing, and often we see a very small plant literally covered with blossom. They are at this stage very attractive, and this is exactly the time that unskilled people get enamoured with them, and will have their places planted with them. This profusion of blossom is the constitutional ruin of the tree. The Quince stock does not swell proportionately with the scion wrought on it. The root

becomes paralysed, the sap stagnant, and an unnatural effort of nature throws out a profusion of weak seminal blossom, where leaves and young wood ought to come. I could point out some trees in this county, in this state; not only did they miss fruit, but the trees presented a most miserable appearance. Instead of hanging even with a few fruit, they were hanging with a few stunted leaves, and no growth. When the trees get in this state all the vegetable physiologists and all the *quack doctors* in Britain would not effect their recovery. And the side-way of attributing the failure to atmospheric causes, is not admissible in this case, as a lady's hooped petticoat would completely envelope one of them, and in the most frosty night of March, be there as warm and comfortable as love in a summer-house.

Such is the character of the Pear generally, when grafted on the Quince stock, and those who are about to plant, would do well before burning their fingers, to take into their serious consideration the universally adopted system of root pruning with the Pear stock. — WILLIAM MILLER, in *Kilkenny Moderator*.

Gowran Castle Gardens,
1st Sept., 1857.

REVIEW.

AMPELOGRAPHIE FRANÇAISE, &c.; a Description of the Principal Vines, Methods of Culture and Wine-making, employed in the best Vineyards in France. By VICTOR RENDU, Inspector-General of Agriculture. Published under the auspices of the Minister of Agriculture. Folio. Paris, 1854-56.

(Continued from page 426.)

No. 3.

O for a draught of vintage, that hath been
Cool'd a long age in the deep-delv'd earth,
Tasting of Flora and the country green,
Dance, and Provencal song, and sun burnt mirth!
O for a beaker full of the warm South—
Full of the true, the blushful Hippocrene,
With beaded bubbles winking at the brim,
And purple-stained mouth,
Tha: I might drink and leave the world unseen,
And fade away into the forest dim!

So sang poor Keats, amid "the weariness, the fever and the fret" of depressed circumstances, declining health, and, as yet, a dearth of fame. Probably he knew of the vintage, of which he speaks, chiefly from the lays of the Troubadours. Had he lived to be a great and celebrated poet, as doubtless he would have been, when his youthful effervescence had worked off, and his genius had been matured by age, he would probably have quaffed "beakers full of the warm South," drawn from the claret bins of the rich booksellers and other patrons of literature in London. It is in the Claret wines that we, in this country, at least, can recognise the "true, the blushful Hippocrene."

It is to be regretted, for the sake of temperance, as well as for other reasons, that the wines of the Bordelais are so little known among us. It was not always so. The ancient alliance which so long subsisted between France and Scotland made French wines the most common of all, north of the Tweed, up to the middle of the first half of last century. Claret was the common drink of all who aspired to the character of gentlemen. It is celebrated in the bacchanalian lays of the times; and "the tappit hen" of the old song was a pewter jug containing three quarts of claret drawn fresh from the butt and surmounted with a crest of foam, or, as Keats has it, of "beaded

bubbles winking at the brim." So general, indeed, was the use of this wine, that it was everywhere employed throughout Scotland for sacramental purposes. But statecraft has changed all that. The wars with France in the end of the 17th and the beginning of the 18th centuries made clarets scarce and high-priced; and the Methuen treaty with Portugal in 1703 cast the balance in favour of the wines of the Peninsula. We then became bound to receive the wines of Portugal in exchange for our woollen manufactures, and to deduct from the duty on importation one-third of the rate levied on French wines. The impolicy of that treaty is now generally allowed; and yet the principles of free-trade are very slow in making their way in this quarter. No doubt that most respectable person, Mr John Bull, has become accustomed to drink Port and Sherry; and his brothers, Alexander and Patrick, when they do not addict themselves to mountain dew or poteen, are too prone to follow his example. Public habits are very difficult to change. It might be hoped that the present *entente cordiale* might tend to break off that preference for Peninsular wines which is certainly undeserved. It has been said, indeed, that the present duty on French wines—one shilling per bottle—is not a prohibitory one, and ought not to discourage their consumption. That is true of high class wines, such as the finest Claret or Burgundy—one shilling on wines sold at six or eight shillings per bottle cannot be considered very high; but it is certainly prohibitory on wines costing in their own localities only 8d or 10d per bottle, those *vins d'ordinaire*, which, as Comte Odart truly remarks (*Ampellog. Universelle*, p.191), are the most useful and commendable of all. Certainly the cheaper French wines must be better known in this country before it become the fashion to drink liberally with our allies.

The wine-region of the south-west, formerly called Guienne and Gascony, is composed of about 11 departments, and yields a great number of varieties of wine more or less valuable. Of these, the Vins de Medoc, or Clarets; the Vins de Grave, in the immediate vicinity of Bordeaux; the Vins de Cotes, on the right shore of the Gironde; and the Vins de Palus, grown on the low lands near the confluence of the Garonne, and the Dordogne, are the most noted; though even these are divided into first, second, third, and sometimes fourth classes. At present we must content ourselves with a brief account of the clarets. They are produced in the district of Medoc, which forms a sort of tongue of land lying between the noble estuary of the Garonne and the ocean. Geographically considered, Medoc begins about 2½ leagues below Bordeaux, and extends to the extreme point of the peninsula; it is only a part of this, however, farther down, and along the left shore of the river that forms the true cradle of the claret wines. M. Rendu informs us that a space of about 28 miles in length, and varying from 5 to 12 miles in breadth contains all the notable vineyards of the district. About 50,000 acres are occupied with vineyards; these yield about 4½ million gallons of wine, of which only from 1-9th to 1-5th part, according to the season, can be accounted fine wines. The three first-class vineyards are Chateau-Margaux, measuring 200 acres, and yielding annually 11,000 or 12,000 gallons of wine; Chateau-Lafitte, measuring 167½ acres, and yielding from 13,000 to 16,500 gallons; and Chateau-Latour, extending to 105 acres, and producing from 8000 to 10,000 gallons. It will be seen that the clarets of the finest growths amount to from 32,000 to 38,000 gallons per annum; and when it is considered that these quantities are all that are forthcoming to supply the wants of the world, it must be evident that the *premieres qualitiés* cannot be very common articles. We have named the vineyards in the order in which their products are esteemed in France. M. Rendu enumerates four additional classes, with their respective vineyards, the acreage, and quantities produced by them. He adds that England, Holland, Russia, and the north of Europe are the principal countries to which the wines of Medoc are exported. The first classes are rarely drunk in France.

The region of Medoc is highly favoured by nature. It is far south in France, and is under the influence of the moist climate of the ocean, and the

warmth of the gulf stream. Its products are, therefore, abundant, compared with other parts of France. Its isothermal line, bending in the interior, towards the north, passes between the districts which contain the vineyards of Burgundy, and those that produce the Hermitage and Cote Rotie. The autumns of Burgundy are warmer and drier; and hence the products of that country are stronger and more alcoholic than those of the Bordelais. The finer clarets are noted for their bouquet; and, being less spirituous than the wines farther east in France are better adapted for general use in the dietary of life.

The varieties of Grape commonly cultivated in Medoc are the *Cabernet-Sauvignon*, the *Franc-Cabernet*, the *Merlot*, *Malbec*, and *Verdot*. Of these the first is considered the best; and stands in the same relation to the claret wines, as the Pineau does to Burgundy.

In such an extensive range of country, there are numerous diversities of soil: it is commonly however gravelly; or of gravel mixed with stones, sand, and black earth. Sometimes the ridges are almost wholly composed of stones. There are often inexplicable peculiarities in soil and situations. The territory of St Estephe is adjacent to Lafitte; and yet the produce of the former sells for only one fifth or one sixth the price of the latter. So again Brantmouton has the same exposure as Lafitte, and is separated from it only by a footpath, and yet its wine is worth one third less in money value. In preparation for planting, the soil is trenched to the depth of 20 or 22 inches, and is carefully levelled. Where the situation is damp, provision is made for carrying off the surplus water by means of open ditches or by drains. The Vines are planted in rows, the cuttings being dibbled in at 43 or 44 in. distant in the rows, and about 40 in. between the rows. The plants are trained to rails laid along about a foot from the ground, and supported by upright stakes at short distances from each other. The pruning and training, which are very carefully attended to, are too complicated matters to be described by us at present. Manuring is repeated occasionally according to the wants of the Vines. The spaces between the rows receive four dressings during the year, mostly by means of small ploughs, constructed for the purpose, besides two slighter dressings with the hoe.

In Medoc the vine flowers about the 10th or 15th of June. After that, it undergoes a sort of summer pruning; unnecessary shoots are removed; and the points of those that remain are pinched off. In good years the vintage begins about the 20th of September; in inferior seasons it is about three weeks later. Women and children cut off the bunches which are picked and dressed on the spot, the green or damaged berries being plucked out. The grapes are afterwards picked more than once before they are submitted to the press. After this, a number of minute operations are adopted. In general the wine remains four years in wood before it is bottled. It is usually fit for drinking in six years; but there are singular variations in this matter. The vintage of 1825 took twenty years to mature; that of 1828 only seven or eight; those of 1834 and 1847 a shorter period; while the wines of 1846 are not yet ready for use.

M. Rendu closes his account of the wines of Medoc by stating that "the wines destined for the English market, before their despatch, undergo a peculiar preparation which consists in mingling them with a certain quantity of the wines of the south, particularly red Hermitage. This alliance, required by palates accustomed to port wine, and strong alcoholic liquors, necessarily communicates to the wines of Medoc a warmth and a spirit which they do not naturally possess; but which causes them to lose, at the same time, a part of the fineness and softness which reside entire in the unmixed wines. Art does not succeed in its imitations. The wines of Medoc require no mixture to attain their perfection.

And now we must bring our notices of this admirable work, *Ampelographie Francaise*, to a close. We feel that our slight sketches can convey no adequate idea of its treasures. They are somewhat like carrying about a brick

as a specimen of a house. We recommend the book in its cheaper form at least to the attention of our readers. We doubt not that it will be a vast magazine of materials to be drawn on by book-makers on wines, for many years to come.—*North British Agriculturist*.

CALEDONIAN HORTICULTURAL SOCIETY.

The autumn competition of this Society took place in the Experimental Gardens, Edinburgh, on Thursday the 10th Sept. The following is a detailed list of the prizes:—

The first prize for Peaches was gained by Mr D. Campbell, gardener to James Johnston, Esq., of Alva, with Red Magdalene and Catherine; and the second by Mr King, Balmuto House, Kirkcaldy, with Red Magdalene and Royal George.

The premium for Nectarines was assigned to Mr Wm. Whytock, gardener to the Right Hon. Count de Flahault, Tulliallan Castle.

In Muscat Grapes there were six competitors, and three premiums were awarded; the first to Mr Joseph Ewing, gardener, Castle Menzies, by Aberfeldy; the second to Thomas Whitelaw, gardener to Sir Hew Dalrymple, North Berwick House; and the third to Mr J. George Edwards, Balbirnie.

In Plums there were eleven competitors, and the prize was awarded to Mr Whitelaw, North Berwick House, for Washington. A second premium was assigned to Mr James Goodall, Newbattle Abbey, for the same variety; and a third to Mr James Laurie, Kimmerghame, by Dunse, for Victoria.

The prize offered for the best Melon, for which there were five competitors, was awarded to Mr Alexander Thomson, gardener to Robert Sym Wilson, Esq., Woodburn, Dalkeith.

In Jargonelle Pears there were eleven competitors, and three premiums were awarded; the first to Mr Lawrence Geddes, gardener to John Grant, Esq., Kilgraston, Bridge of Earn; the second to Mr Peter M'Tavish, gardener to Lady Mary Oswald, Manor House, Inveresk; and the third to Mr Henry Joyce, gardener to Sir John Bethune, Bart., Kileconquhar House, Fife.

There were four competitors for Gooseberries. The first prize was awarded to Mr George Tait, gardener to D. Lindsay, Esq., Ardargie House, Bridge of Earn, for Hedgehog; and the second to Mr James Thomson, gardener to L. Buchan, Esq., Colinsburgh, Fife, for Warrington.

Two premiums were awarded for Black Hamburg Grapes; the first to Mr Laurie, Kimmerghame; and the second to Mr Francis Story, gardener, Broomlands, Kelso.

For the highest flavoured bunch of Grapes there were four competitors, and two premiums were awarded; the first to Mr Laurie, Kimmerghame, for Grizzly Frontignac; and the second to Mr King, Balmuto, for the same variety.

The prize for Pine Apple was gained by Mr William Gavin, gardener to the Right Hon. the Earl of Hopetoun, Hopetoun House.

For Apricots the prize was awarded to Mr John Logan, gardener to William Ivory, Esq., W.S., St Reque, Grange Loan.

In Green Gage Plums there were five competitors, and three premiums were awarded. The first to Mr Whitelaw, North Berwick House; the second to Mr Geddes, Kilgraston; and the third to Mr Goodall, Newbattle.

For the best collection of Culinary Vegetables there were eleven competitors, and the prize was gained by Mr King, Balmuto. A second premium was voted to Mr Smith, gardener to William Macfie Esq., of Clermiston; and a third to Mr William Reid, gardener to the Hon. Henry Coventry, Newhailes, Musselburgh.

The prize of One Sovereign, offered by the office-bearers, for the three best arranged Bouquets, for which there were nine competitors, was awarded to Mr G. M. Butler, Inverleith Nursery; and the second premium (Half-a-Sovereign) was assigned to Mr John Fraser, Rosebank Nursery, Trinity.

The prize of Half-a-guinea, offered by Messrs Downie & Laird, for the best six Phloxes, brought three competitors, and was gained by William Blackwood, Esq., Minden Cottage, Peebles, with the following sorts:—President M'Carol, Jeanie Bouillard, General Brea, Alba perfecta, Madam Couslin, and Madam Rendalter.

The prize of Half-a-Guinea, offered by Messrs Downie & Laird, for the best twelve Verbenas (for which there were also three competitors), was awarded to Mr Archibald Dunlop, gardener to A. J. M'Nab, Esq., Inglis Green, Slateford, for

Victory, Admiral Dundas, Mademoiselle Piccolomini, *Grant des Batailles*, Auguste Manget, Madame Restaura, Madame Plantamour, Miss Trotter, Loveliness, Esther, Defiance, and Glorie de France.

There were six competitors for the Silver Medal offered by Messrs P. Lawson & Son, for the best collection of Turnips and Carrots, viz., not fewer than four sorts of Carrots, and the following kinds of Turnips:—Early Dutch, Snowball, Stone, Yellow Altringham, Finland, Golden Stone, Malta, Orange Jelly, Felton, Bortsfeld, Round Black Skinned, Pink Top White. The prize was gained by Mr George Tait, Ardgargie.

The prizes offered by the promoters of the Grand Dahlia and Hollyhock competition were also competed for this day, and were awarded as follows:—First prize of Four Sovereigns to Messrs Downie & Laird, nurserymen, West Coates, for the best 24 Dahlias, viz., Annie Rawlings, Lord Raglan, Lord Cardigan, Duchess of Wellington, Mrs Edwards, Lollipop, Lord Palmerston, Beauty of Slough, Primrose Perfection, Princess, Lady Franklin, Fanny Keynes, Miss Caroline, Admiral Dundas, Rachel Rawlings, Perfection, Mrs Legge, Duke of Wellington, Reginald, Incomparable, Bessy, Ruby Queen, Cherub, Lady Popham. The following blooms were specially noticed by the judges:—Cherub, Admiral Dundas, Lady Franklin, Mrs Legge, and Pessy. The second prize (Two Sovereigns) was awarded to Mr Thomas H. Douglas, florist, Rosebank Nursery, Trinity, who produced Lord Palmerston, Fanny Dodds, Colonel Wyndham, Beauty of Slough, Robert Bruce, William Tell, Fenella, Touchstone, Fairy Queen, Lady Franklin, Minnie, Lord Bath, Yellow Beauty, Perfection, Royal Scarlet, Duchess of Wellington, Princess, Duke of Wellington, Empress, Lollipop, Lady Popham, Cherub, Mrs Wheeler, Roland. In this stand the following flowers were unusually fine:—Lord Palmerston, Lady Franklin, Touchstone, and Royal Scarlet. The third prize (One Sovereign) was awarded to Mr Thomas Handasyde, Glen Nursery, Musselburgh, whose stand contained fine blooms of Fanny Dodds, Annie, Lady Popham, and Admiral Dundas.

For the best twelve Dahlias, produced by practical gardeners or amateurs, the Silver Cup, value five guineas (given by Mr Edwards), was awarded to Mr James Henderson, gardener to C. K. Sivewright, Esq., Cargilfield, whose stand contained the following flowers:—Lady Popham, Midnight, Perfection, Yellow Beauty, Touchstone, Royal White, Eclipse, Annie, Bessie, Lord Palmerston, Cherub, and Mrs Wheeler. In this stand the most noticeable flowers were—Cherub, Lady Popham, Royal White, and Touchstone. The second prize (£2, 10s) was awarded to Mr John Turner, gardener to W. E. Hope Vere, Esq., Craigiehall, Cramond, for Lady Palmerston, Empress, Pre-eminent, Lady Franklin, Duchess of Wellington, Lollipop, Beauty of Slough, Princess, Annie, Lady Popham, Perfection, Yellow Beauty. The finest flowers in this stand were Beauty of Slough, Annie, and Lord Palmerston. The third prize (£1) was assigned to Mr Thomas Reid, gardener to William Wilson, Esq., of Bromfield, Davidson's Mains.

For the best six Dahlia blooms, produced by growers of not more than thirty plants, the prize (£1) was awarded to Mr King, Balmuto House, whose varieties were—Lord Palmerston, Princess (which was fine), Pre-eminent, Lollipop, Annie, and Beauty of Slough. The second premium (10s) was assigned to Mr William Cuthbertson, superintendent of the Dean Cemetery, for Lord Palmerston, Beauty of Slough (a good flower), Lollipop, Empress, and Yellow Beauty.

For the best twelve Fancy Dahlias, produced by nurserymen, the first prize (£1, 10s) was awarded to Messrs Downie & Laird, for Carnation, Lady Paxton, Mrs Hansard, Tam o' Shanter, Jonas, Conqueror, Eugenie, Topsy, Lady S. Douglas, Pigeon, Enchantress, and Magician. The stands produced by Mr Handasyde, Musselburgh, and Messrs J. Dickson & Sons, Inverleith, were so nearly equal in merit that the second prize was divided between these two competitors.

The first prize offered for the best six Fancy Dahlias, produced by gardeners and amateurs, was not awarded, as none of the stands were of sufficient merit. The second prize (£1) was gained by Mr A. Walker, gardener to John Mood, Esq., Rosehall, with Carnation, Mrs Hansard, Eugenie, Enchanter, Topsy, *Triomphe de Roubaix*. The third prize was assigned to Mr George Scott, gardener, Polmont Park, by Falkirk.

For the best bloom in the room, the prize was awarded to Messrs J. & R. Thyne, Glasgow, for Colonel Wyndham.

For the best eleven Spikes of Hollyhocks, produced by nurserymen, the first prize (£4) was awarded to Messrs Downie & Laird, for Souvenir, Standard, Miss Nightingale Improved, Hon. Mrs Ashley, Dysart Beauty, Miss Ashley, Beauty of Cheshunt, Salmon King, Autocrat, Lizzy, and Memnon. The second prize (£2) was

awarded to Messrs W. Ballantyne & Son, Dalkeith, for Joan of Arc, Queen of Fairies, Lady Middleton, Eva, Queen of the Buffs, Empress, Lilac Model, Penelope, Solfaterre Improved, Juno, and Mrs Oakes. The third prize (£1) was assigned to Mr John Black, florist, Currie.

For the best nine Hollyhocks produced by practical gardeners or amateurs, the first prize (£4) was gained by William Blackwood, Esq., Minden Cottage, Peebles, with the following sorts:—Queen of Fairies, Sulphur Queen Improved, Masterpiece, Memnon, Mrs Oakes, Empress, Lady Middleton, Beauty of Dysart, and Solfaterre. The second prize (£2) was awarded to Mr William Thom, gardener to Charles Balfour, Esq., Newton Don, Kelso, for Lemonade, Glory of Cheshunt, Lemonade Improved, White Globe, Brennus, Hon. Mrs Ashley, Beauty of Cheshunt, Miss Ashley, and Pourpre de Tyre. The third prize (£1) was assigned to Mr John Pow, Norton, Ratho.

The best spike in the room was one of Memnon, in the prize stand of William Blackwood, Esq., Peebles, to whom the prize was accordingly awarded.

In addition to the above, there were also competed for several extra prizes offered by Mr John Keynes, Salisbury, to Scotch growers, viz:—

For twelve Fancy Dahlias, six tipped and six striped, produced by nurserymen, the prize (£1, 10s) was gained by Messrs Downie & Laird, West Coates, with Enchantress, Jonas, Mrs Hansard, Conqueror, Comet, Magician, Eugenie, Carnation, Duchesse de Bratiantes, Inimitable, Cockatoo, and Lady Paxton; the two last were fine flowers. The second prize (£1) was awarded to Mr Thomas H. Douglas, Rosebank, for Lady Scott Douglas, Lady Paxton, Tam o' Shanter, Paquillot, Trinity Beauty, Model, Carnation, Magician, La Vogue, Miss Frampton, Lady Kerrison, and Attraction. The third prize was assigned to Mr Handasyde, Glen Nursery, Musselburgh.

For the best six Fancy Dahlias, three tipped and three striped, produced by gardeners or amateurs, the first prize (£1, 10s), was awarded to Mr John Berry, gardener to Robert Newton, Esq., Middleby Cottage, Newington, for Baron Alderson, Duchess of Kent, Glory de Keynes, Triomphe de Lebeck, Comet, and Marveille. The second prize (£1) was awarded to Mr Turner, Craigiehall, for Comet, Carnation, Tam o' Shanter, Kossuth, Alexander, and Lady Paxton; and the third to Mr Walker, Rosehall.

In addition to the articles sent in for competition, there were, as usual, a number of productions placed on the tables for exhibition only.

Mr John Reid, Ballindean, exhibited fine Mushrooms, also a seedling Dahlia named the Hon. Mrs Trotter, to which a first-class certificate was awarded.

From the nurseries of Messrs P. Lawson & Son, Golden Acres, were beautiful blooms of Roses and Dahlias, also Japan Lilies and Greenhouse Plants; from Mr R. M. Stark, Edgell, Dahlia blooms and a selection of rare Ferns, including Cheilanthes ligidigera, Pteris geraniifolia and scaberula, Adiantum lucidum and radiatum, Davallia elegans, and Onychium auratum; from Mr T. H. Douglas, Rosebank, Dahlia blooms and five varieties of Tropæolum; from Messrs Downie & Laird, West Coates, thirty-six varieties of Verbenas, including many of the newer sorts; from Mr Handasyde, Musselburgh, a collection of nearly two hundred Dahlia blooms, including many of the best self and fancy kinds; from Messrs Wright, Renwick, & Co., Leith Walk, a selection of Stove and Greenhouse plants; from Mr Charles Alexander, West Register Street; African and French Marigolds, China Asters, Statice Halfordii, blooms of Dahlias, Hollyhocks, &c.; from Mr R. T. McIntosh, seedling Hollyhocks; from Messrs J. Dickson & Sons, Inverleith, fruiting Vines in pots; from Mr Black, florist, Currie, a seedling Hollyhock; and from Mr Middlemass, a seedling Hollyhock, named Commander-in-Chief, which was commended.

From the gardener of W. E. Hope Vere, Esq., Craigiehall, there were beautiful Dahlia blooms; from John Mood, Esq., Rosehall, Dahlias and Asters; from Mr John Taylor, gardener to Archibald Scott, Esq., Inveresk, Marigolds and seedling Potatoes; from Mr John Urquhart, Viewforth, Stirling, a seedling Hollyhock; from Mr Thomas Davidson, Galashiels, a seedling Hollyhock; from Blackadder Gardens, fine specimens of Lawson's Golden Gage Plum; and from Mr Fraser, Belmont, a large specimen of Vegetable Marrow; from Mr Mossman, gardener to W. Hunter, Esq., Thurston, fine Peaches, Nectarines, and Black Hamburg Grapes; from Mrs Paterson, Wardie Cottage, Black Hamburg Grapes; from Mr Whitelaw, North Berwick House, a fine bunch of Barbarosa Grapes. The show was much enhanced by some well-fruited Apples in pots; also many fine specimens of Japan Lillies and other Greenhouse plants from the Society's collection.

The day being rather unfavourable, the attendance of members and visitors was

not so numerous as at former promenades this season. The splendid band of the Rifle Brigade was in attendance.

In the evening the members and their friends dined together in the Café Royal—Thomas Sprot, Esq., W.S., in the chair; Robert Girdwood, Esq., croupier. Mr Fortune, from China, Mr Glendinning and Mr Edwards of London, Mr Deans, of Slough, and other gentlemen from a distance, joined the party.

AUTUMN FRUIT AND FLOWER EXHIBITION AT THE ROYAL ZOOLOGICAL GARDENS, EDINBURGH.

The fourth grand flower competition for the season took place on Saturday the 12th September, in these Gardens. Owing to the inclemency of the weather few visitors were present. The rain, however, did not damp the energies of the competitors and exhibitors, a large and varied collection of plants having been brought forward. As this was the last exhibition under the auspices of the directors of these Gardens for this year, the best thanks of the community are due to those gentlemen for the able manner in which they have carried out the shows during the season. The competitors and exhibitors have also done their utmost to ensure the success of the undertaking. Next season, we have no doubt, an increased share of patronage will be accorded to those delightful floral fetes. We subjoin the list of prizes:—

Twenty-four Dahlias (by Nurserymen)—1st, Messrs Downie and Laird, with Airedale Beauty, Mrs Legge, Lady Franklin, Emperor Napoleon, Duke of Wellington, Lord Palmerston, Mr Seldon, Admiral Dundas, Fanny Keynes, Mrs Wheeler, Mrs Turner, Lady Folkestone, Duchess of Wellington, Lord Cardigan, Reginald, Sir F. Bathurst, Cherub, Lady Popham, Annie (Rawlings), Delta, Perfection, Colonel Wyndham, Mrs Edwards, Lollipop; 2d, Mr Thomas Handasyde, Musselburgh; 3d, Mr T. H. Douglas, Rosebank.

Twelve Dahlias (by Gardeners or Amateurs)—1st, Mr James Henderson, Cargilfield, with Lord Palmerston, Beauty of Slough, Lollipop, Annie (Rawlings), Lady Popham, Pre-eminent, Bessie, Perfection, Eclipse, Cherub, Mrs Edwards, Mrs Wheeler; 2d, Mr John Turner, gardener, Craigiehall, Craigmoid; 3d, Mr William Munn, gardener, Hazelbank.

Hollyhocks—Eleven Spikes (by Nurserymen)—1st, Messrs Downie & Laird, with Rubens, Salmon King, Memnon, Honourable Mrs Ashley, Dysart Beauty, Miss Nightingale, Improved Souvenir, Miss Ashley, Primrose Perfection, Lizzy, Beauty of Cheshunt; 2d, Messrs William Ballantyne & Son, Dalkeith.

Hollyhock—Nine spikes (by Gardeners or Amateurs)—William Blackwood, Esq., Minden, Peebles, with very fine specimens of Empress, Masterpiece, Beauty of Cheshunt, Queen of Buffs, White Globe, Solfaterre Improved, Queen of the Fairies, Memnon, Sulphur Queen Improved.

Six Greenhouse or Stove Plants (by Nurserymen)—1st, Messrs James Dickson & Sons; 2d, Messrs Peter Lawson & Son.

Six Greenhouse or Stove Plants (by Gardeners or Amateurs)—1st, Mr Stewart, gardener, Dalhousie Castle; 2d, Mr Lockhart, gardener, Arniston.

Two Cape Heaths—Mr Lockhart, Arniston.

Fuchsias, two—one dark and one light—Mr Archibald Walker, gardener, Rosehall Newington.

Roses, twelve sorts—1st, Mr Adamson, gardener, Balcarres; 2d, Mr James Douglas, gardener, Southbank; extra award to Mr A. Robertson, gardener, Rockville; do., to Mr Reid, gardener, Newhailes.

Phloxes, six spikes—William Blackwood, Esq., Minden, Peebles.

Verbenas, twelve blooms—Mr A. Dunlop, gardener, Inglisgreen.

Scarlet Geraniums, three—1st, Mr Tod, Gardener, Tor, Murrayfield; 2d, Mr Munn, Hazelbank.

Culinary Vegetables, twelve sorts—1st, Mr Adamson, Balcarres; honorary 2d, Mr John Pender, gardener, Moredun.

Hand Bouquets, six—1st, Mr John Fraser, Rosebank Nursery; 2d, Mr James Mitchell, gardener, Ravelston; honorary 3d, Mr Campbell, Warriston Lodge.

Extra Prizes.

Messrs Dickson & Co.'s prize of One Guinea for the best three bunches of Grapes, sorts, was awarded to Mr Thomas Whitelaw, gardener, North Berwick House.

Messrs Downie & Laird's prize of Half-a-Guinea for the best six fancy Dahlias, sorts, was awarded to Mr John Turner, gardener, Craigiehall.

The prize of Two Guineas, and One Guinea, by the Proprietors of the Gardens,

for basket of Fruit, was gained by Mr William Stewart, gardener, Dalhousie Castle, and Mr John Pender, gardener, Moredun. An honorary prize was awarded to Mr Gavin, gardener, Hopetoun House.

There was a large collection of articles exhibited, over and above those competing. Messrs Lawson & Son showed Dahlias and other Plants; Messrs Downie & Laird exhibited a beautiful assortment of Hollyhocks; Messrs Wright, Renwick, & Co., a select lot of Greenhouse and Stove Plants, including many fine and new varieties; and Mr R. M. Stark, showed a miscellaneous collection of very fine Plants; Messrs Cunningham, Fraser, & Co., exhibited a number of excellent Conifers; Mr Charles Alexander, of Larkfield Nursery, Trinity, had a large table on which was neatly arranged a splendid collection of new Fuchsias, Dahlias, Hollyhocks, and Greenhouse Plants; Messrs James Dickson & Sons displayed, among other things, a new vegetable, named Edible Potted Radish; Messrs Ballantyne & Sons, Dalkeith, had several stands of first-class Dahlia Blooms; Messrs Dickson & Co. had also a fine assortment of the same flower; Mr Douglas, gardener, Rosebank, also exhibited Dahlias; Mr James Niven, gardener, Keir, showed two specimens each of Seedling Hollyhocks, named "Stirling Castle," and "The Flower of Dunblane."

The Judges were (Nurserymen's class)—John Edwards, Esq., London; Mr James Henderson, Cargilfield; Mr John Young, Archerfield. Gardener and Amateurs' class—Mr John Downie of Downie & Laird; Mr John Pender, Moredun; and Mr Edwards.

CALENDAR OF OPERATIONS FOR OCTOBER.

VEGETABLES.

No time should now be lost in getting plantations of Brown Coss and hardy green Lettuces made. Cauliflower may be placed, five plants in a hand glass, on a south border for the early crop; those for later crops may be placed in frames for protection during the winter. Plantations of Early Cabbage should also be made without delay. Spawn Mushroom beds, and keep the temperature of the house from 55° to 60°. Protect Cauliflower from early frosts, by taking it up and placing it in dry sheds or cellars. Trench vacant ground, and clear off all decaying vegetables to the rot heap.

FORCING DEPARTMENT.

PINES.—Keep last month's directions still in view with regard to the growth and management of succession stock. Now that the nights are longer, and we have less light and solar heat, the humidity and temperature of these structures should be moderated accordingly. Range the night temperature about 63°; give more or less air every fine day, and shut up rather early with sun heat when such can be had; and, unless the weather prove stormy, or unusually cold, endeavour to do without the use of covering till the end of the month. The undue use of coverings is calculated to keep the atmosphere more close and humid than is good for Pines at this season of the year, while most of the young stock is making growth; and the consequence of such a state of the atmosphere is sure to end in a mere elongation of the tissues of the plants, the effects of which would be apparent in the spring in weakly plants, and not unfrequently very small and deformed fruit. Young stock in want of more pot room may now be shifted with advantage, and if kept growing all winter, and rested a while early in the year, can be had to start in March and April, when they form a valuable succession. In shifting these, be sure that an open light soil is used, and that the pots are well drained; and in plunging them in their winter quarters, let them have plenty of room, and keep them near the glass, so that they enjoy all the light possible. Where fruit are swelling off, maintain a night temperature of 70°, with a proportionate amount of humidity. Fruit colouring must have a good supply of dry, warm air, and be kept dry at the roots, otherwise flavour will be deficient. Take special care of any that may start at this season of the year; if these be kept in a dry, light part of the house, and

gently stimulated through the winter, they will come in at a season when fruits are scarce, and be much valued. One of the most valuable (perhaps the most valuable), Pines for winter and early spring supply, is the smooth-leaved Cayenne, and all who do not possess it, should do so at once; it swells better, and is more juicy in winter than any of the others in general cultivation. Maintain a regular and moderate bottom heat to plants in all stages, and from whatever source heat is derived, guard by every possible means against sudden fluctuations.

VINES.—Pay great attention to Grapes that are intended to hang through the winter. No plants requiring water should be tolerated in such vineries, and fires should be frequently made to expel damp. Go over the bunches once or twice a-week, and remove every mouldy berry as soon as it appears. No time should be lost in putting everything in connection with the early vinery in working order. Prune the Vines forthwith, and paint them over with a mixture of clay, cow dung, soot and soft soap, made of the consistency of thick paint. Endeavour to get a good layer of this mixture to adhere to the rods; it not only destroys insects if such there be, but it retains moisture, which is of great importance, especially in early forcing. Where Grapes are required by the early part of April, the vinery should be "shut up" by the end of the month. Pot Vines intended to fruit still earlier should be started with a gentle application of fire heat by the end of the month. Paint them over as directed above, and if possible let them have a gentle bottom heat, and in tying them up twist them round a few stakes till they break. However, it must be borne in mind that unless you have good strong thoroughly ripened canes, it will be useless to start thus early. If young Vines that were planted last spring or summer are not brown and well ripened, they should now have fire heat and a free circulation of air in order to get them well matured. However, this has been a favourable season for ripening, and Vines are for the most part well ripened; and good crops, all other things being equal, may be looked for next year. If necessary precautions have not been taken against heavy rains in the case of all outside borders, no time should now be lost.

PEACH HOUSE.—The early house should now be put in order—the walls whitewashed, the trees pruned, washed, and nailed or tied. Fork up the borders, and in doing so, fork in a slight dressing of well decomposed dung. If new borders or fresh trees be required, now is a good time to accomplish such. Trees that may have been planted last season in fresh soil, may in some instances have made too strong wood. In such cases a good plan is to partially lift them, and cut back the strongest roots, and re-plant them near the surface.

ORCHARD HOUSE.—All plants from which the fruit has been picked in this structure should now be root pruned by cutting off their connection with the border on which they have been placed, and they may now be kept rather dry and got to rest, and if the house be required for anything else, the trees may be put close together at one end of the house.

CUCUMBERS AND MELONS.—Maintain a sweet and genial growing temperature in the Cucumber house. Do not let the thermometer fall below 70° at night, and give a little air on every fine day. Stop the Vines at every joint or two, and do not let them overbear themselves, so as to become weakened, and lessen the chances of Cucumbers for the two following months. Lessen the amount of atmospheric moisture as the season advances, and we have less light. Where the roots are in proximity to the heating apparatus, see that a check does not occur for lack of moisture—a slight mulching of well rotted manure will be of service in this respect. Where there are any Melons still to ripen, let them have a dry warm atmosphere, and expose the fruit as much as possible to the sun, otherwise the flavour will be indifferent.

STRAWBERRIES IN POTS.—If the directions of former *Calendars* have been carried out, these will now be large well ripened crowns, almost bursting their pots with roots. Should heavy rains prevail, lay the pots on their sides—or if the late Peach house or orchard house can be spared for such, remove

them by the end of the month, where they will be sheltered from the severities of the weather all winter.

FLORISTS' FLOWERS.*

HOLLYHOCKS.—Gather seed as soon as ripe. Continue to strike cuttings, and let those that were early struck and planted out to strengthen, be potted and placed in frames for the winter. Let this be also done with the roots of the finer sorts that have bloomed this season.

DAHLIAS.—See that the collection have all their proper names attached to each. Do not take up the roots as long as frost keeps off. Secure seed where ripe.

PANSIES.—Get the general stock potted, and make a selection at the same time of those intended to bloom in pots; place all in a cold frame, and keep the plants as near the glass as possible. Give plenty of air whenever the weather is favourable. If not previously done, those intended to flower in beds should be planted out immediately. Plant out seedlings if the plants are strong; if not, they had better be kept till spring. Cuttings of the finer sorts may still be put in, and if properly attended to, will make fine plants in spring.

CINERARIAS.—Plants intended for exhibition or early blooming should be shifted on, as they require more pot-room; shift on seedlings also, using light rich soil. Keep the plants near the glass. If mildew appears, dust the affected parts with sulphur, and fumigate to keep down greenfly. Give air on all occasions when the weather is favourable.

PELAGONIUMS.—Repot young plants as they require more pot-room, and encourage them to make good growth. During October and November keep the houses dry and well aired, but avoid cold cutting winds. Give the plants as much room as possible at this season; destroy aphides by fumigation.

CALCEOLARIAS.—Continue to pot off the young stock as soon as they are sufficiently rooted; use a good rich light soil, giving plenty of drainage. Pot off seedlings, etc., remove decayed foliage from the old plants, and be careful to keep under greenfly by occasional fumigation.

BEDDING PLANTS.—Lose no time in putting in cuttings of anything of which a sufficient quantity has not been previously prepared, and the proper quantities fully made up.

AURICULAS.†—Every attention must be paid during the month to keep the plants clean. They are now approaching to their dormant state, consequently will be losing their leaves rapidly. Look over them every second day, and take away the decaying leaves. Should any of the plants have thrown up autumn blooms, remove the decaying stems as early as possible, for fear of inducing disease. During the month, give but a moderate supply of water, and only when they require it. Allow them plenty of air, but guard against wet lodging in the centre.

POLYANTHUS.—During the month treat them the same as the Auriculas.

TULIPS.—Get the beds in readiness for planting. Soil in which Tulips are to be planted should be trenched at least two feet in depth. When large blooms are wanted, a thin layer of very old cow-dung placed not less than a foot below the bulbs, will produce the desired effect. Keep in mind that the soil in which the bulbs are to be placed must be quite free from dung. Get the bulbs arranged for planting—Rose, Byblomen, and Bizarre alternately—and according to the height of the stems. Offsets may be planted any time during the month; plant them in rows six inches apart, and cover them with at least three inches of soil.

PINKS.—All the attention required is to keep the beds free from weeds, and the surface soil in a loose state.

CARNATIONS AND PICOTEEES.—The layers of these plants have rooted well this season; any that may still be attached to the parent plants should be taken off, and potted in the store pots without loss of time. Treat the new

* By Mr J. Downie, of Downie & Laird.

† By Mr G. Lightbody, Falkirk.

potted plants according to the instructions given last month. After they have struck root in the new soil, give them plenty of air, and harden them so as to enable them to stand the winter. Water the plants as they require it; give plenty of air, day and night; keep the foliage clean, and in a dry state, for fear of spot; remove all dead leaves, and stir the surface soil when in a hard state.

CHRYSANTHEMUMS.*—For large blooms continue to disbud late plants as recommended for last month. If wanted to come in bloom with the early sorts place them at the bottom of a south wall, leaving the early blooming kinds in the open ground, so long as there is no danger of frost. They will all require to be housed by the middle of the month, placing the early sorts at the coolest end of the house. Give all air possible, and if required, a little fire to dry up damp and prevent mildew.

Specimens and Pompones should also be housed by the middle of the month, previously tying all the shoots and washing the pots. Give liquid manure as required, increasing it in strength, should the leaves get yellow. Mr John Frost must be guarded against, for if he once get a hold of the young bloom buds of the Chrysanthemum, they will never expand to satisfaction even on the finest plants.

AZALEAS.—The earliest and best budded plants should have the warmest and lightest part of the greenhouse to prepare them for early forcing; remove all decaying foliage, and tie in any straggling shoot; discourage growth on young plants.

EPACRIS.—The above for Azaleas are also applicable for these.

NOTICES TO CORRESPONDENTS.

MILDEW ON VINES.—Our Vines have done very badly, having all cracked when they began to colour; and they have also grown badly, being only about half their usual size. Be so kind as tell the cause in your next month's publication, and you will much oblige—W. M. [If your Grapes are affected with mildew, it may account to some extent for their being so small. The Chasselas Musk Grape generally cracks at the stage you name, but we know no other variety that does; we fear the evil lies at the root. See that your borders are well drained, and that no noxious gas escapes from your flues.]

SEEDLING FLOWERING FRUITS, &c.—You will oblige by stating in your Magazine if there is a standing committee in existence in connection with any Society in Edinburgh, whose office it is to sit in judgment on any presumable Hybrid, flower, fruit, or vegetable, and to pronounce judgment thereon. Such a Notice will be useful; as, if any such body exists, it appears to be *sub rosa*.—C. H. [No one can doubt that such a committee connected with a Society having the confidence of the country, and discharging the duties referred to, would be of service. But no such committee exists. Any new florists' flowers may be sent to Mr Downie, of Downie & Laird, and a Notice will appear in the following number of the *Scottish Gardener*. Specimens of fruits and vegetables are also subjected to the opinion of a most successful grower and judge, and duly reported on.]

FLOWER SHOWS.—Being for a short time in Scotland, and being an amateur florist, I paid a visit to the Horticultural Show held at Dunoon on the 5th inst. I was much struck on witnessing such a very fine display of fruit, flowers, and vegetables; but I considered, as well as many other visitors present, that the appearance of the Hall was much spoiled by cut flowers being exhibited in beer, pickle, and stone bottles. Perhaps you would give the managers a hint of this through your useful Journal.—AN ENGLISH TOURIST. [The practice referred to is, in some shape or other, not uncommon in Scotland. The incongruity does not seem to be so generally felt here as in England; yet no one can doubt that there is such an incongruity, and that the refining influence of floriculture and flower shows only reaches its legitimate results as taste becomes the presiding genius, not of a flower show alone, but of our social habits and arrangements generally. Where flowers are, however, exhibited by day labourers, as they often are in Scotland, they cannot be expected to be presented in very refined vehicles.]

* By Mr Laing, Dysart Gardens.

THE SCOTTISH GARDENER.

THE BEAUTY OF NATURE IN RELATION TO LAND. SCAPE GARDENING.

No. 5.—WATER.

Of the various elements of natural scenery, one of the most interesting and beautiful is water. The eye loves to rest on it, and never fails to direct itself towards it as if by instinct. In passing through a country with which we are familiar, we often cast a very transient glance on the tints and forms of wood, and plain, and mountain; but we seldom fail to allow our attention, drawn as by some natural magic, to settle on any sheet of water which may come within our view. Man and child gaze with awed delight on the boundless expanse of the ocean. Visits to lake and river scenery form the most popular and pleasing of our excursions. Poetry has tasked itself to celebrate their beauties. The most cherished associations of men, relative to their native land, are generally interwoven with its rivers. Tweedside, the Banks and Braes of bonny Doon, Allan Water; a hundred other streams and river basins have been celebrated in the lays and the music of our country. The higher imaginings of our race have entwined themselves with the Rhine and the Danube, and the mystic Nile, and the far Euphrates, and the Jordan's sacred stream. One of our most vivid images of the earthly paradise is the fourfold river that winded through the garden. Doubtless other memories and interests are mingled with these associations, but unquestionably the intrinsic beauty of the liquid element is that on which they are all originally based. When we look to the kindred art of painting, we find the landscape artists introducing water wherever they possibly can.

One of the great charms of water is the wonderful facility with which it enters into combination with other component parts of na-

tural scenery. This plastic quality is well set forth by Wheatley in his observations on Modern Gardening. "Water though not absolutely necessary to a beautiful composition, yet occurs so often, and is so capital a feature, that it is always regretted when wanting; and no large place can be supposed, a little spot can hardly be imagined, in which it may not be agreeable; it accommodates itself to every situation; is the most interesting object in a landscape, and the happiest circumstance in a retired recess; captivates the eye at a distance, invites approach, and is delightful when near; it refreshes an open exposure; it animates a shade; cheers the dreariness of a waste, and enriches the most crowded view; in form, in style, and in extent, may be made equal to the greatest compositions, or adapted to the least; it may spread in a calm expanse to soothe the tranquillity of a peaceful scene; or hurrying along a devious course, add splendour to a gay, and extravagance to a romantic situation. So various are the characters which water can assume, that there is scarcely an idea in which it may not concur, or an impression which it cannot enforce; a deep stagnated pool, dank and dark with shades which it dimly reflects, befits the seat of melancholy; even a river, if it be sunk between two dismal banks, and dull both in motion and colour, is like a hollow eye, which deadens the countenance; and over a sluggish, silent stream, creeping heavily along, altogether hangs a gloom, which no art can dissipate, nor even the sunshine disperse. A gently murmuring rill, clear and shallow, just gurgling, just dimpling, imposes silence, suits with solitude and leads to meditation; a brisker current, which wantons in little eddies over a bright sandy bottom, or babbles among pebbles, spreads cheerfulness all around; a greater rapidity, and more agitation to a certain degree are animating; but in excess, instead of wakening, they alarm the senses; the roar and the rage of a torrent, its force, its violence, and its impetuosity, tend to inspire terror, that terror which, whether as cause or effect, is so nearly allied to sublimity. Abstracted, however, from all these ideas, from every sensation, either of depression, composure or exertion, and considering water merely as an object, no other is so apt soon to catch and long to fix the attention." Wheatley adds:—"the characteristic property of running water is *progress*; of stagnated is *circuit*—the one stretches out into length, the other spreads over space."—pp., 61—63.

Water in motion is possessed of many attractive properties, which are calculated to impress the mind of even the unobservant and the careless. The thundering waterfall, the tall cascade, and the foaming cataract, are objects of universal curiosity, and are visited by many who make no pretensions to be lovers of the picturesque and the beautiful. But they are not of very common occurrence; and with the exception of the tempest-troubled sea, in marine localities, water in motion occupies but little space in the landscape, and is for the most part a thing, which you must come and look at close at

hand. Even a flowing river seems to be standing still when viewed from a little distance. Perhaps moving water is not the less interesting on this account; for it is in particular objects as discerned by close inspection, that we are struck by the immense diversity of Nature. A Greek poet celebrates "the innumerable dimpling laughter of the waves." How mobile—how susceptible of influence is flowing water—yet how readily it smooths out every wrinkle, with those—

Stealthy withdrawals, interminglings mild
Of light with shade, in beauty reconciled!

We readily feel, though we may have difficulty in analysing the varied charms of the prattling brook, the exulting and the abounding river, and the wide heaving sea. But strange to say, it is standing water, or water whose motion is invisible, that enters chiefly into the beauty of landscapes. Stagnant water—that is surely the tamest and flattest thing in nature—and yet it is possessed of undeniably picturesque qualities. In the words of the English poet already quoted—

Soft as a cloud is yon blue ridge—the Meer
Seems firm as solid crystal, breathless, clear,
And motionless; and to the gazer's eye
Deeper than ocean, in the immensity
Of its vague mountains and unreal sky.

Wordsworth, vol. VI., p. 167.

It is somewhat paradoxical that this flat level thing—the only real level to be found in nature—should often be so exquisitely beautiful; but a careful examination of some of the more prominent qualities and relations of standing water will reveal to us the causes of that admiration, or at least attention, which it almost invariably awakens.

Part of the interest connected with water is probably to be found in its exclusiveness. It occupies spaces from which, in ordinary circumstances, we are peremptorily shut out. The solid earth has been given to the children of men, at its very margin water says "hitherto shalt thou come and no farther." Without the art of swimming, or the aid of boats, we cannot pass over its depths, which concealed below the surface are, to a casual spectator, unknown and therefore threatening. Man must go round water; his steps are not on its paths, and this is probably the idea which Wheatley expresses by the unusual term *circuitry*. It is curious that eye follows very much the same circuitous course, for it attaches itself particularly to the forms and boundaries of water. Other idealisms perhaps attach themselves to this fine feature of landscapes; but of these at present we cannot attempt the investigation.

The very circumstance which at first sight appears to affix to water the brand of tameness, viz., its presenting a plane or even surface, is one of its qualities most productive of beauty. Its level

plane forms a base line, from which all other visible lines, heights, and distances may be measured. A sheet of water, such as an inland lake, or an arm of the sea, often acts like the frame of a picture, exhibiting an island, a rocky shore, or islet mountain, somewhat in the form of an actual painting, or what architectural draughtsmen call an "elevation." Let us imagine a valley of moderate breadth and depth, partially covered with wood, and traversed by a small stream;—in most positions, the objects, in the central part, bear a confused relation to each other; the eye can make no definite estimate of forms, contours, or distances; everything has a sort of labyrinthine effect; and the whole, in short, is a den, as it is called in some parts of Scotland. But suppose that an embankment is thrown across a narrow place, in the lower extremity of the valley; and that the water, dammed back, assumes the form of a lake, following, as it invariably does, the natural concaves of the ground—then a base line, or rather plane, is provided, which at once dissipates the central confusion, and affords a standard with which every contour is compared, and from which every height and distance is measured. Even in artificial lakes where the embankment is properly concealed, and impertinent excavations are avoided, the result is often fine, or at least pleasing. In natural lakes the effect is generally most felicitous; for in these, there is, for the most part, a perfect harmony between the level surface of the water and its winding margins on the one hand, and the curves and slopes of the banks, and perhaps the sky-line of the opposite rising ground on the other. Every thing is at least natural. Compare this effect with that of a horizontal terrace, with its talus or retaining wall, varying perhaps in breadth or depth from a yard at the one extremity, to five or six yards at the other. Or compare it with the effect of a long architectural façade, seen in contrast with an imminent sky-line of discordant character. In both of these latter cases, we have witnessed, and could easily cite most unhappy efforts of art. The fine effects of natural water, above referred to, arise principally from that beauty of perspective, to which we directed the attention of the reader in the third paper of this series.

The reflective power of water is one of its main elements of beauty; for it is this property which imparts to it its gleaming lustre, and its diversified yet harmonious suites of colour. "Even when it is attended by the most unfavourable circumstances," says Sir T. Dick Lauder, in his notes to Price, "it (water) is sure to be productive of one grand and ever changeful effect—I mean that of repeating the splendid colouring of the clouds, as well as their magical movements over the blue ether; whilst its occasional reflection of the moon, or that of the setting sun, which kindles up the wavelets on its surface into golden flames, are accidents of the most gorgeous description. However small a body of water may be, it will be found to yield this description of beauty, in a greater or less degree, exactly in proportion to that of its size." (*Lauder's Price*

p. 224.) In another page he adds :—" Even on the smallest piece of water, a swan produces a sparkling effect, when seen amid the bright light, or the deep green shadow, which is thrown over the surface of the pool by the superincumbent foliage." Here, however, he is not referring so much to the effects of reflection, otherwise he could scarcely have refrained from quoting Wordsworth's famous couplet :—

The swan on still St Mary's Lake
Floats double, swan and shadow !

A most beautiful image, perhaps the most beautiful that has been presented to us by this gifted Seer of Nature.

We take the liberty of citing another passage, from Price himself, and one which completes the statements in the foregoing quotation from his commentator. " One striking property of water, and that which most distinguishes it from the grosser element of earth is its being a mirror ; and a mirror which gives a peculiar freshness and tenderness to the colours it reflects. It softens the stronger lights, though the lucid veil it throws over them seems hardly to diminish their brilliancy, and gives breadth, and often depth, to the shadows, while from its glassy surface they gain a peculiar look of transparency. These beautiful and varied effects, however, are chiefly produced by the *near* objects—by trees and bushes immediately on the banks, by those which hang over the water, and form dark coves beneath their branches—by various tints of the soil where the ground is broken—by roots and old trunks of trees—by tussacks of rushes, and by large stones, that are partly whitened by the air, and partly covered with mosses, lichens, and weather stains ; while the soft tufts of grass, and the smooth verdure of meadows with which they are intermixed, appear a thousand times more soft, smooth, and verdant by such contrasts."—(*Lauder's Price on the Picturesque*, p. 213.) And these effects are not confined to absolutely standing water, as at first thinking we might be inclined to suppose. The reflections from a pellucid and gently flowing stream, constantly interrupted and as constantly repeated, are to the meditative eye among the most interesting sights of nature ; and are beautifully described by Shelley in his unfinished poem on Evening, *Ponte a Mare Pisa* :—

Within the surface of the floating river
The wrinkled image of the city lay ;
Immoveably unquiet, and for ever,
It trembles, but it never fades away.

" But," says Price, in continuation of the passage cited in the preceding paragraph, " to produce reflections there must be objects." The remark is made with a polemical reference to Brown—the *bete noir*, or black sheep, the refutation and abuse of whose practices have made Price's otherwise pleasant and instructive work a collection of bitter controversy ; but it is true in itself, and it has an important

meaning relative to the formation of artificial water. It is often easy enough to convert a valley of slight declivity into a stagnant lake; and it is sometimes possible to transform a briskly flowing streamlet into the semblance of a sluggish torpid river. But then, as Price says, "to produce reflections there must be objects;" and the great defect of Brown's canals and artificial rivers, he informs us, was that they could reflect only a few trees sprinkled over their tame banks. Their banks, it seems, were stiff and formal from their extreme nakedness. This, indeed, is one of the main difficulties in modern Landscape Gardening. Artificial water has certainly been its weak point; and this has arisen either from forgetfulness of the principle that very much of the beauty of water is dependent on its accompaniments, or from the fact that the origination of these felicitous accompaniments is a work of great difficulty. It is easy enough to plant trees, to build a bridge, or to erect a turret on a tame island; all that may be done with few or no picturesque effects; but to throw up knolls, to bring scarped precipices within the angles of incidence and reflection, and to spread over a clear and weedless lake the morning or evening shadow of a mountain:—these may be results which the artist may strive in vain to accomplish. And then, unhappily, it is often in low, flat, tame situations that improvers are most tempted to create sheets of water. What miserable shapeless ponds we have seen, full of reedy, weedy, muddy, dirty ditch water—a nursery of tadpoles in summer, and a paradise of frogs in autumn—the entourage offensive to more senses than one—the air savouring of agues—and the entire physiognomy of the scene the lifeless image of the dull uninventive mind of its creator. Artificial water!—the remembrance of most that we have seen has a tendency to make us shiver.

Ought, there, then, to be no artificial water? Remembering the beauty of this element in Landscape, we may not say so: but considering the numerous failures in this most difficult work, we would say that the artist should be cautious in attempting what he may not be able to realise. Above all, he ought to study the doings of Nature in this matter. It is singular how little can be learned of it from books. The Landscape Gardener who would really be a successful practical man must go and observe and meditate by the highland lake, and mountain tarn, and lowland meer, and sub-alpine streamlet, and broad flowing river; and he must contemplate not only the water in its various states of quietude and excitation, but the grounds, the rocks, the scaurs, the banks and braes, and all the other objects which we have called the accompaniments of water. And when he has stored his mind with ideas, he ought to remember that he requires as much the executive power of a sculptor, as the eye and hand of a painter, in order to reach the practical realisation. We have a few more remarks on River and Lake scenery, distinctively so called, which we must reserve till another time.

S.

POTATOES: THEIR AILMENTS, CULTURE, &c.

BY MR R. ERRINGTON, OULTON PARK, TARPORLEY.

THE advent of that terrible disease, which is at least pointed to, by the ravages of the well-known *Botrytis infestans*, commonly called the Potato disease, has caused a kind of era in the history of this valuable root; and there can be little doubt that its culture as compared with former days has been considerably modified in consequence. It is my intention here, to glance at the probable causes of this national disaster, and after to point to what I conceive leading features of culture as dictated by the facts before us. In the first place, what is the real cause or origin of the disease? Now the country people in some parts with which I am acquainted, call such mysterious matters by the ambiguous name "stricken"; that is to say, such things as they cannot account for; and they take care to invest them with a due amount of mystery. Indeed, we are surrounded by mystery. But to supinely lay every difficulty to a mysterious account is neither wise nor philosophical. Certainly the singular universality of the disease was extraordinary, and would seem to point to something almost as universal as the atmosphere itself. But we may remember, that the spread, diffusion, and interchange of Potatoes, was a matter common to all civilised countries; and, therefore, what might happen to any one at a given period, might happen to many others. There can be no doubt that few vessels have departed from our shores for many years without taking Potatoes with them as part of their stores; and it is but reasonable to suppose that on many occasions some have been left on those shores which they have frequented: thus both our kinds and our disease have been made common to many lands. As to the origin of the disease, there can be little doubt that continued ill-usage for a long period has been instrumental in inducing a kind of debility in the root, however flattering their growth may be when suddenly excited by manures. It seems to be a very general opinion, too, that a higher amount of manurial matters has been applied in later years than formerly; and hence a gross, but in many cases an unsubstantial plant. Fermentation in pits has doubtless occurred to a pernicious extent, and this for several years was regarded as unimportant. It is now, however, the opinion of experienced gardeners, if not of many agriculturists, that such extreme treatment is prejudicial to any plant.

And what is a Potato tuber? Our botanists term it an underground stem; but it must be remembered that this underground stem is studded with buds, which are in a high degree analagous to seeds; and if so, I should be glad to know what seeds would bear steaming in a pit for weeks, at a temperature of eighty to a hundred degrees? Indeed, I have some twenty years since, seen

Potatoes in pits fairly reek with steam ; and have heard farmers repeatedly observe, that such was by no means of rare occurrence in those days. Thirty years ago, in these parts (Cheshire) farmers used to plant very late—commonly in May—even to the end of the month ; and the consequence was, that the late kinds, such as the old red Apple, were as green in the end of October as they are now in July : and instead of ripening by a course of nature, as in their own climes, were almost invariably battered into a sort of rest condition by the autumnal storms. They were generally taken up in the first or second week of November, at a period when the ground had become saturated with moisture, and were at once tumbled from the carts into the deep pits, in bodies of about five feet in depth or width, and immediately covered up with soil. How was it likely that a plant from the warm and dry uplands of Peru, should long endure this treatment, without evil consequences ? Another source of weakness arose from the habit people had in those times of rubbing off all the earliest sprouts, and causing the Potatoes to fall back on an inferior series of buds. I have seen the Potatoes intended for seed growing through six or eight inches of soil, which covered the pits ; these when taken out to plant in May, the farmers would shake them in a wire riddle to clean them, and as they shook them, they stripped away every shoot. Now, we know that in the case of Dahlias or any other tuberous roots, that the excited sprouts may be rubbed away until vitality is completely destroyed ; and, indeed, it is so with most plants ; here then has been a constantly recurring source of weakness. The evils here adverted to must also be considered of an accumulative character, not as isolated facts ; and to this point I would draw particular attention.

I have before adverted to the manure question, and I may return to it here, and offer a few remarks. There has of late years been a considerable amount of guano used for Potatoes, and not unfrequently guano and manure both in the same drills ; this done of course with a view to obtain weighty crops. Now, although an advocate myself for liberal manuring, I must observe, that there are many experienced persons who believe, that there are limits assigned to every cultivated plant, as to its productive power ; and I think it a fact, although no man may state those limits. For instance, a Swede turnip may, and has been grown by myself, of the weight of much more than 20 lbs. ; a Drumhead Cabbage I produced in 1830 of 70 lbs., and I had a single root of Potatoes nearly 70 lbs. But who can by any stretch of imagination suppose that these weights could be trebled, or even doubled ? Unquestionably there are limits, and I verily believe that in attempting to push any profitable plant up to the very highest limits of culture, we are at once in danger of inducing disease. Of course, I do not for a moment urge this as a bar to improvement. I merely wish to observe, that caution is necessary in this, as in most cases. I may here allude to the wearing out of kinds, irrespective of disease. When I first came

into this country in 1828, there was a different set of Potatoes almost *in toto* from those now grown. There was then the old red Apple in full vogue, and several kinds of Blues now unknown, besides many others I could name—the only one in general culture still, being the Ash-leaf Kidney. Now these have all shared the same fate; that is to say, they were cultivated and handled as before described, until from yielding three to four bushels to the Cheshire rood—of sixty-four yards—they gradually dwindled to less than a couple of bushels; and this, of course, drove them out of cultivation. They were superseded by newer kinds; but how these newer kinds were produced, not one in a hundred could ever tell; the probability being, that a person here and there raised seedlings, and from such some acquire a name and a standing for awhile, when they too share the fate of their progenitors.

Now, what shall we say to all this? Shall we call it wearing out, or what? Call it what we may, we have a just right to enquire why it should be so. We all know that fine sorts of Dahlias get into disrepute; that they actually blossom worse; but I see no just comparison here. The one is a question of mere blossom, the other that of roots and the starchy and other valuable secretions of which they are the storehouse. In judging such difficult questions, we must beware how we use analogies or comparisons; better not compare at all, than use fallacious comparisons. Potatoes are planted year by year on highly cultivated ground, manured liberally, taken up at their time, stored, re-planted; yet they fall away! I must not forget here to advert to the case of whole Potatoes *versus* cut "sets." This may not be passed by. Although it would appear to be necessary in many cases to cut Potatoes in order to economise the seed used, yet there can be little doubt that it is taking considerable liberties with the laws of Nature. We may fairly compare it to the possible injury received by any fruit through the repeated process of grafting; but then the thought occurs, that the same may be urged as to propagation by cuttings. The fact is, that providentially the vegetable kingdom has been endowed with wonderful healing or self-restoring powers, for very obvious reasons; but that an undue advantage may be taken of such wonderful economy is equally obvious. For the last four or five years I have made a point of planting the Ash-leaved Kidney specially for seed, and I by no means regret it. My object in doing this, was to obtain a sample of Kidneys adapted for setting whole; and in order to avoid cutting, which is almost universally admitted to be prejudicial to this valuable Kidney. To this end, I set small well-shaped Kidneys on poor land, so thick, that they cannot by any possibility grow too large to plant whole; and I can only add that I have accomplished my object, and that since I have adopted that plan, I have rarely seen a case of disease in these Kidneys. I have as fine a sample now for seed as it is possible to imagine, and I am not

aware that even one has decayed since they were taken up in the early part of July. They are on a floor spread out, as green as a Cabbage, and fully as firm as though they were about entering into a state of petrification. Whether the absence of disease is attributable to the practice of planting whole Potatoes, I am not in a position to say; but this I may observe, that I hold with the practice of taking up Potatoes for seed in an under-ripe state—Kidneys especially.

On the whole, Potatoes this season are, I think, much better than was at one time expected, at least in these parts. And here I may notice one phase in the progress of the disease, which may not have occurred to some of the readers of the *Scottish Gardener*. It is this—that when the disease commenced, or rather in the earlier years of it, there was not only rotten Potatoes at taking-up time, but also others at the same root in various stages of decay, having little promise. Now, however, in these parts, where Potatoes are grown so universally, and as high in quality as any in the kingdom, things are very different. At taking-up time, there may be found one or two or more at a root all but decayed, but there does not appear to be many in the first stages of the disease; thereby indicating that the disease has nearly spent itself, or become suddenly arrested.

As concluding advice, I would say, so plant your Potatoes as that their sprouts appear first above ground in the third week of May—not earlier. Be moderate in the use of manures, preferring that highly decayed. Take up those for seed before the disease has progressed, preferring under-ripe sets to diseased ones: and finally, take care the seed does not ferment—rather spread it on floors thinly where possible.

HOT WATER CIRCULATION.

BY MR THOMSON, DALKEITH PARK, DALKEITH.

I NEED not remind the readers of the *Scottish Gardener* that a few squibs passed between your esteemed correspondent, Mr Anderson, of Meadowbank, and "Old Stoker," on the above subject. The former gentleman, in an article on heating horticultural buildings, after supplying useful estimates for flues, shows most convincingly that heating by hot water is at least as cheap in the first instance when properly set about as flues, and he might have added that by the use of the former the annual expense for cleaning and whitewashing flues is avoided. This is a tax which of itself will pay 5 per cent. on the whole expenditure for hot water. He then goes on to draw comparisons between various descriptions of boilers, correctly or otherwise, it is not at present my intention to discuss. He concludes by remarking that a good boiler should contain but little water, as "there is little or no circulation in pipes till the

water boils in the boiler." This latter statement brought out "Old Stoker," who, in the course of some remarks on it, appealed to me, as to whether the water ever boiled in a boiler I had occasion to refer to in your pages on a previous occasion. He said, "Mr Thomson, in your last issue says, that he caused 500 gallons of water to pass through one of his boilers in 40 minutes from the time the fire was applied. He would very much gratify and perhaps instruct me if he would say whether with this rapid work to commence with he considers there was no circulation in the pipes till the water boiled in the boiler? or whether the water ever boiled at all?" As I must reply in the negative to the latter query, I need make no reply to the former, and notwithstanding I have been frequently asked by readers of the *Scottish Gardener* why I had not replied to the reference to me, I should yet have been silent, in as far as I reluctantly have to take part with an anonymous correspondent, were it not that every day brings to my notice a singular confusion of ideas on the subject of heating by hot water, in themselves insignificant, but in their application most injurious to the progress of horticulture; and when Mr Anderson speaks of "boiling water in the boiler," "expansion box high enough above the boiler, and air pipes communicating between the two, there is not the slightest danger," &c., &c. To the uninitiated all this sounds very like generating steam, and blowing the apparatus to pieces, if any of the safety valves in the shape of pipes and expansion boxes were to get out of order. The consequence is, that the amateur and others with a shake of the head and shrug of the shoulders, say to themselves, such machinery may do in experienced hands, but with us it would be dangerous; so we will stick to the old flue and run the risk of an explosion of foul air, sulphuric acid gas, and all its other evils, for we are at least familiar with them.

Farther on in his August article, Mr A. argues that "if you excite water to 100 °, that will produce circulation;" "if farther excited to 150 °, that will produce more circulation; and if excited to 212 ° that will of course produce a most rapid circulation." And still farther on he says it is his "unchanged opinion that the greater the heat the more rapid the circulation:" inferences which Mr A. bases on false premises, for circulation does not at all depend on any given temperature of the water. It depends solely on a disturbed equilibrium of the temperature of the water in the boiler and pipes. By the application of heat to the boiler, the water gets expanded by the caloric it absorbs; consequently a given cube of the water in the boiler is lighter than the same cube of water in the return pipes, which being denser—heavier, or stronger, if you like the term better—rushes in under the warm water, and shoves it out at the flow-pipe, and if the boiler is of the proper construction, and the pipes properly fixed, the water will never be allowed to remain in the boiler, to get above a degree warmer than that which constantly rushes in to take its place. To make the matter more plain, let me

say that I will undertake to produce circulation in pipes and boiler without fire at all. In a summer day, I will take ice, and lay it along the return-pipe—lower the temperature of the water in it by some degrees, when it will rush rapidly into the boiler, and displace that which it contains; and circulation will from this cause go on till all the water gets to the same temperature, when it will cease—just as it would cease, if it were possible to get all the water in boiler and pipes to 212° .

I was recently asked by a Nobleman's gardener, in the south of Scotland, to look at a couple of large boilers they had for heating a conservatory some 60 feet long by 20 feet broad—attached to said boilers were lots of safety valves—high pressure cisterns, and things I am at a loss to give names to—I was told that during severe weather they burned 3 tons of coal per week, and were inefficient; the gardener has wisely pulled them out and substituted a boiler costing less than one of their safety valves did, and I expect he will find 3 tons of coal carry him through the winter.

Heating by hot water is the simplest, the least liable to accident, the cheapest, if properly erected, and by far the most efficient of any known system: and no gardener can hope to cope with those who have the advantage of hot water as a means of heating, if he has it not; and if in this I am correct, it seems a pity to make it appear a complicated affair, and the tendency of much that is written about it is in this direction.

Before concluding, let me add that whenever the water in any boiler boils, if there is any extent—say 100 feet of pipe attached to it, rest assured that the pipes are improperly laid as to levels, unless there be an enormous disproportion between the power of the boiler and the work it has to do, which should not be the case.

NOTES FROM MY POCKET BOOK.

BY MR WM. DEAN, LATE OF THE ROYAL NURSERY, SLOUGH.

A RECENT trip through Scotland enabled me to see a few of the new Pansies coming out this autumn, as well as some of the varieties sent out last year among those to be sent out at once. I think White & Sinclair's Lady Napier will be found a first-class variety, of a white ground coloured with light blue purple belting, and fine solid eye. Mr Pollock of Kilmarnock, has also two very good ones that have been raised in the neighbourhood, viz., Tom Stewart, rich yellow ground, with medium maroon belting, very fine solid eye, and good form; and Margery, cream ground, with rich purple belting, and plenty of ground colour, and fine eye. The only fault to be found with this flower is, that the eye is scarcely dense enough in the side petals. Messrs Downie & Laird have also some good things to send out, but unfortunately I have seen nothing of them

except Mrs Hope, which is a very fine yellow-ground flower. Of Messrs Dickson & Co.'s new ones I know nothing. Of last year's kinds, a few of the best are—Col. Windham, (W. & S.,) and Lady Palmerston, (W. & S.,) are both good yellow ground kinds, with the eye well shown on the side petals; but a little too much rayed in both flowers. Chromatella, (Syme & Middlemas,) is a useful yellow; Yellow Model is not so first-class as was expected, and is prone to colour or stain in the top petals, but has a fine solid eye; Russia will, I think, be found a better yellow; Princess Royal (W. & S.,) is a good straw ground flower; and Sir George Cathcart (W. & S.,) is a fine yellow ground flower, but deficient in solidity of eye. Lightbody's Don Roderick is not good, and Holland's Prince Albert, and Duke of Cambridge, I have not seen good. Hooper's Emperor Napoleon is a good yellow-ground flower, with broad dark purple belting, and fine eye; and Mr B. Stowe, (P. & S.,) is a useful white-ground flower. Abbotsford and William Douglas are both useful yellow-ground flowers; and Delight, (P. & S.,) Emmeline (Hooper), and Louisa (Douglas's), which is best early are all useful white ground varieties. Blue-eyed Maid, a white self, with large blue centre, seemed a useful flower. Napoleon (D. & Co.), is not a first-class yellow ground, with bronzy purple belting, and large eye, but useful. Sir E. Lyons (Hooper) is a very fine flower, resembling the Countess of Rosslyn, but, I think, better; and Miss White (P. & S.,) is a good white ground, in the style of Queen Victoria. Hooper's Brilliant is a fine white ground flower; but his Orestes is a poor flower, and deficient in colour. Lord Cardigan (Hooper), and Nena (P. & S.,) I do not regard as acquisitions. Countess of Rosslyn (D. & Co.), is a good white ground, with broad belting; and Colonel Wyndham (D. & Co.), is also a good light ground flower. There were no new flowers from the south this year, excepting Hooper's seedlings, the chief of which I have noticed.

The seedling Dahlia, named "The Hon. Mrs Trotter," exhibited at the autumn meeting of the Caledonian Society, promises to be a useful flower, and novel in colour, being blush white, with a pale rosy lilac picotee top, good centre, depth, and form, to which a first-class certificate was properly awarded. Mr Laing's Hollyhock, "Dysart Beauty," a pale blush pink variety, should be in every collection. I noticed among the Hollyhocks exhibited as particularly good—Salmon King, salmon pink, and fine spike; Autocrat, shaded salmon red, fine spike; Empress, pale buff, fine but rather loose spike; President, light red, fine flower, but loose spike; Miss Nightingale improved, fine flower, but rather loose spike; Queen of Buffs, fine close spike; and Lady Middleton, pale salmon, fine flower, and very fine spike. Messrs Syme & Middlemass exhibited a box of blooms of a seedling Hollyhock, named Commander-in-Chief, of a rich crimson marrow colour, that will prove a very useful

and good variety, and having seen it growing, I am enabled to say it will produce a close spike.

Dahlias seemed to be blooming well generally in the north, and I saw some of the new varieties in good character in many places. These shall form the subject of a separate communication.

Mr Thomson of Dalkeith has invented a gas hot-water stove of immense ability to those who have small greenhouses, without proper means of heating them, and these structures abound to a very great extent, especially in the neighbourhood of London and other large towns. It is constructed in the form of a pillar, and is about $3\frac{1}{2}$ feet in height; but, of course, is only available where gas can be obtained. This stove can also be made available for offices, large rooms, &c., and if we could only make up our minds to do away with our "firesides" in towns, and use this gas hot-water stove instead, we should not only effect a considerable saving in fuel, but get rid of chimney sweeps, smoky chimneys, and last, though not least, the complaints of our spouses against the dust constantly generated from the fire places. What a saving in pokers and scoldings for using them!

NOTES ON NEW HOLLYHOCKS.

BY MR LAING, DYSART HOUSE, DYSART.

I have much pleasure in sending you my Notes of a few of the leading Hollyhocks sent out this season, which I trust will be of some service to those of your readers who have not had the pleasure of growing or seeing them during the season.

The Hollyhock is improving rapidly in form and quality—although this year certainly not in colour—the Buffs predominating to a great extent. But, if report speaks true, the Southern growers have some of the much wanted colours in store for us, viz., Crimson, Purple, White, Golden Yellow, &c.; and I trust they will have stock sufficient to meet the increasing demand for such varieties.

Atrosanguinea (Chater), new, dark shining crimson; a most splendid colour for effect in the shrubbery.

Autocrat (Chater), light reddish crimson; a large, bold, rather coarse flower; will produce a five feet spike; not to be grown too strong.

Beauty of Dysart (Laing), beautiful deep blush, guard rather large; requires strong growth and plenty of liquid manure to fill the centre.

Beauty of Walden (Chater), rosy carmine; a most beautiful and finely formed flower, and splendid spike; one of the finest.

Ceres (Chater), rosy crimson; style of, but scarcely so good as, *Autocrat*.

Diadem (Downie and Laird), shaded lilac; a late flower of great

substance ; requires generous treatment and warm weather to see it in perfection ; best of its colour.

Empress (Chater), fawn, apricot base ; fine form and spike ; a fine variety.

Lady Middleton (Chater), rosy crimson, shaded with salmon, smooth and fine ; splendid spike.

Memnon (Paul), light crimson, fine form and spike ; best of its colour.

Ochrolenca (Chater), sulphury white ; well filled centre, crown rather flat, splendid spike.

Primrose Perfection (Paul), primrose, great substance, crown a little flat, fine spike.

Queen of Buffs (Chater), pale buff, smooth and close, splendid spike ; one of the finest.

Queen of Whites (Paul), pure white, large but coarse ; worth trying again, as it was exhibited in London last season in splendid condition.

Rubens (Downie and Laird), bright rosy crimson, large and showy, but rather coarse when full expanded.

Solfaterre Improved (Bircham and Ward), pale yellow, fine form, and spike the best of its colour.

Sulphur Queen Improved (Chater), sulphur, shaded with fawn, a smooth fine flower, and fine spike.

Saturn (Chater), clear apricot, a fine flower, entirely free from pockets ; guard inclined to be frilly ; fine spike.

Village Maid (Paul), a pale coloured beauty of Cheshunt ; a good useful variety.

Vesta (Fellowes), pale straw, good form and spike.

Walden Masterpiece (Chater), lemon, shaded with pink ; a large, bold, smooth, first-rate flower ; the best of the season.

Walden Rival Improved (Chater), bright orange, shaded with crimson ; guard rather large, good spike.

COMPARATIVE HORTICULTURE.

5.—THE *TROPÆOLUM* IN FRANCE AND BELGIUM.

In the *Flore des Serres* for March, M. Louis Van Houtte has a popular monograph on the genus *Tropæolum*, from which we propose to present our readers with a few extracts. We omit his amusing account of a clever trick by which he obtained a plant of the White Indian Cress from the Botanic Garden at Brussels. It would seem that, as late as 1847, in some continental establishments there were still some remains of that illiberal exclusiveness and spirit of monopoly which were prevalent at Kew in the days of Sir Joseph Banks and the first Aiton, when George III. was King. The first part of

M. Van H's paper is descriptive of the tuberous rooted species of *Tropæolum*, which we shall pass over as containing nothing very novel or interesting, and shall proceed to the second section, which treats of the species or varieties with fibrous roots, and which are annuals in ordinary culture.

T. Magus, the common Indian Cress, a native of Peru, introduced in 1684—the best known of all. It adorns the windows of the poor, and possesses the rights of citizenship everywhere.

T. Minus, introduced in 1850, a small form of the preceding, of which it is only a variety, though a distinct and permanent one. The seeds of these two soils may be sown as soon as frosts are no longer to be feared. In our country (Belgium) these sowings are made at the foot of a wall, at the base of a pyramid formed of laths, at the root of trees, &c., associated with Sweet Pease and Scarlet Runners. The Indian Cress is also useful for covering bare rocks. Any soil will suit it, provided it is warm, and not too humid, and not deprived of the light of the sun. There is a double variety of *T. minus* which is propagated by cuttings, and wintered with *Geraniums*.

T. Lobbianum, sent from Colombia by Mr Lobb to Mr Veitch, and introduced at Ghent in 1843. It grows rapidly, with a beautiful foliage, and sparkling red flowers. It would have dethroned its predecessors if it had flowered earlier, but unfortunately it begins to show its blossoms only in October, when the *Chrysanthemums* have their flowers endangered by the arrival of the early frosts.

T. Smithii was sent five years later by Mr Lobb to Messrs Veitch. It has peltate leaves, with flowers much fringed. We (*Ed. Scot. Gard.*) suppose that this is what is known in this country as *T. peregrinum*, *alias T. canariense*, the Canary bird plant, which otherwise M. Van Houtte does not notice. If so, he is wrong in his chronology at least.

M. Van Houtte continues :—Horticulture has seized on *T. Lobbianum* and *Smithii*, as affording pollen wherewith to dust the stigmas of *T. majus*, and from these crossings have been derived a progeny of hybrids which recal the vigour of *T. Lobbianum* in its perfection. These varieties being propagated by cuttings, are kept for sale, and are extremely beautiful. The hybridisers have been so busy and successful that the filiation of the different sorts cannot be traced ; and it is necessary to content ourselves with mere garden names.

M. Van Houtte sells the following hybrids propagated by cuttings. They require the shelter of a greenhouse during frosts. Those marked by an asterisk (*) blossom also in winter.

Caroline Schmitt.

* *Etoile de Marseille*, golden yellow, with five blood-red spots.

Grandiflorum fulgens, brilliant orange, with a fiery lustre.

* *Hockianum*, clear red orange, flowers all winter.

- Kotschianum, deep orange red.
 ——— floribundum, clear orange red, sometimes deep red.
 * ——— flore rubro, lively scarlet red.
 * ——— Lilli Schmitt, very lively fiery scarlet.
 ——— tricolor.
 ——— triomphe de Gand, lively red.
 Le Cuivré, chamois-colour, shaded with copper and bronze, with five spots.
 * Massiliense, scarlet shaded with orange, with five spots of amaranth, and chocolate.
 Multiflorum coccineum, deep vermilion red, magnificent.
 * Naudini, citron yellow, with five carmine spots.
 Schulzei, deep reddish scarlet, flower enormously large, plant small.
 ——— grandiflorum, orange and deep vermilion, flower extremely large.
 Scheuerianum, straw coloured.
 ——— versicolor, straw coloured, mahogany point, very curious.
 * Triomphe de Prado, orange salmon with a shade of amaranth, five spots of blood-red, magnificent.
 * Zanderii, scarlet.
 ——— aurantiacum, red orange with a copper shade.
 ——— elegans, canary shaded with nankin.
 ——— grandiflorum, straw coloured, the three inferior petals spotted with crimson.
 ——— marginatum, citron yellow, margin blood red.
 ——— quinquemaculatum, golden yellow, with five vermilion spots.
 ——— superbum, reddish vermilion shaded with scarlet, and with a fiery lustre.
 ——— trimaculatum, golden yellow, with three carmine spots on the inferior petals.
 * Zipserii, golden yellow, petals fringed, abundant in blossom.
 ——— major, deep red orange, the petals fringed, the flower sometimes wholly red, magnificent.

We have translated this long list of varieties in order to convey to our readers an idea of what has been effected on the continent in the way of hybridising *Tropæolums*; and what, doubtless, we could also do, were we to set actively and perseveringly about it. It may be doubted, however, how far it is expedient to import productions, necessarily so fugitive, into this country. Without question some of the M. Van Houtte's plants would afford excellent bedding materials if they could be kept through the dark season in sufficient quantity. The winter-flowering varieties would be an acquisition to the green-house and the conservatory.

[Since the above was in print, we have observed that Messrs. E. G. Henderson & Son, Wellington Road, St John's Wood, London,

in their Catalogue for 1857, enumerate 15 Hybrid *Tropæolums*, mostly the same as the foregoing. They are said to be greenhouse plants, and are described as follows:—"Lobbianum Hybrids are all fine conservatory plants, and if in a higher temperature during the winter will continue flowering profusely; with the exception of elegans all the following require confinement at the roots when cultivated in the open ground." From this it appears that they have less in them of *T. majus* than the descriptions in the *Flore des Serres* had led us to suppose.]

AURICULA BLOOM OF 1857.

BY MR G. LIGHTBODY, FALKIRK.

MUCH has been written in the various garden periodicals, respecting the last bloom, and many of my own blooms have been described by another hand for the *Florist*. I am now among the oldest growers of this very beautiful and fascinating flower, and although the bloom was late, yet I never had the flowers in a more perfect state, nor the plants in more robust health.

The weather last February was particularly suitable to give them a good start, and although the weather in March and April was generally cold and wet, yet the plants never experienced any serious check; consequently, the bloom was a fine one.

Among the Green Edges, the following were conspicuous, with strong trusses, and large and perfect pips.

Clegg's Lady Blucker.—This sort was in first-rate order; and when in this fine state is one of the best show sorts. The tube is good, paste ground colour, and margin of light green, in regular proportion.

Beeston's Apollo.—This is a variety that can always be depended upon for show; it is very steady, whether it blooms from the side or centre. As the plant, to keep it up to size, requires some management by the rubbing away the eyes from the neck when dead leaves are taken away; should this practice be neglected, the plant, from its habit, is sure to break into increase, and the bloom will be lost. It does not produce many pips—stout plants having only from five to nine—but the pips are regular and flat, the proportions correct, and the edge a vivid green.

Ollier's Lady Ann Wilbraham.—This is also an intense green edge, and last bloom was in admirable condition, being nearly free from its usual fault of the ground colour breaking into the margin.

Leigh's Colonel Taylor was in average condition. The edge of this flower is about the most vivid green of any in cultivation, and were the pips free from the angularity that it too often shows, it would be nearly perfect. I have bloomed this sort with a truss of 13 large large pips, and perfectly round. But from the experience

of myself, as well as that of other growers, when it blooms in this extra fine state, the plant that produces the bloom generally dies.

Moore's Violet.—This was a conspicuous flower last bloom, from its tall stem and truss of large and regular pips; it is much in the style of Dickson's *Earl Stanhope*, having the same intense violet ground colour, with a brilliant green edge, and round flat pips.

Lightbody's Sir John Moore.—This variety used to be looked upon as a model. But this season a writer in the *Florist* calls it "goggle-eyed," a term which I can't understand. I consider the proportions of this flower to be the nearest perfection of any Auricula that I have seen. The foliage is highly ornamental, the stem tall and strong, the pips large and perfectly round, and they never reflex. The only fault that I have been able to find with it is, that during the last two seasons, some of the plants have bloomed in the Grey Edged state, instead of Green. But this is of common occurrence in Auricula culture.

Dickson's Duke of Cambridge.—This is a very beautiful variety, being a very brilliant green, with fine violet ground colour, fine paste, and good tube. The only fault that can be found is, that the green margin is too narrow.

Lightbody's Star of Bethlehem.—This is a variety that has been much praised; it is a robust grower, and requires to be grown in a poorer compost than what is generally used, otherwise it is liable to bloom coarse. When in fine bloom, the pips are large and very regular, the stem is tall and strong, the truss has a noble appearance on the stage, it also stands long in bloom. The green margin is intense, and not so liable to be injured by the sun as the major part of the Green Edges.

Litton's Emperor has a tall and stout stem, the proportions are good, the edge a deep green, the pips are at times unequal in size. The great fault of this sort is, that occasionally the paste is defective.

Dickson's Matilda.—This is a very regular and beautiful Green Edge, it is early in bloom, and requires to be kept out of the sun, as the edge is easily injured. The plant is only of small habit, with very beautiful foliage.

GREY EDGES.

Waterhouse's Conqueror of Europe was much finer last bloom than I ever saw it previously, and I have grown it since it was let out. Every pip was alike fine, and extra large. When in this state it is a noble flower.

Fletcher's Ne Plus Ultra.—Every plant of this variety bloomed in the finest condition, owing to the very large size of the pips; five to seven form a fine full truss, one plant of mine produced nine pips, forming the most magnificent truss that I ever saw of it. It astonished every person who saw it.

Cheetham's Lancashire Hero.—This variety should be in every collection, being one of the very finest extant. The plant is not of

robust habit, and seldom blooms with many pips; it is also rather late, and should be grown in a warm corner of the stage. The pips of this flower are very circular and flat, all the proportions regarding tube, paste, ground colour, and edge are correct. One plant of this variety bloomed with 13 large pips, all of the same size, and formed quite a specimen truss; it stood long in bloom, the last of the pips stood till late in June. This variety ought to make the name of "Robert Lancashire," the raiser, memorable.

Syke's Complete.—This is also a fine Grey Edge; the plant is of small habit; it is also a late bloomer; the pips are regular, and of fine quality, but only of medium size; it is hard to open, and requires some heat to cause the pips to expand. The foot-stalks are rather short, and require early thinning of the pips to form a fine truss.

Chapman's Sophia.—This is a very beautiful and fine variety, with large and massive pips, quite circular, all the properties being correct. What renders this flower so striking, is its very brilliant violet ground colour. The plant is of robust habit, with the foliage sprinkled with farina.

Chapman's Maria.—This is a new flower, and without any exception, has the most intense violet ground colour of any *Auricula* known; it must be seen to be appreciated. In general, the pips are circular, and perfectly flat, but last year some of the pips were angular.

Maclean's Unique.—This is also a new flower, with the most intense orange tube of any sort at present in cultivation. The proportions are good, the pip thick and large. It is one of the sorts that will require to have the pips carefully thinned out, the foot-stalks being short; otherwise the truss will be confused, from the pips overlapping. The habit of the plant is robust, forming a handsome plant.

Beeston's Fair Flora.—This sort makes only a small plant; it is, however, a little gem. The pips are very regular, and form a fine truss of medium-sized pips.

Dickson's Unique.—This variety makes but a plant of medium size, with pips of the average size, and of great regularity, with black ground colour. This variety is still scarce; the stock of it having been killed, in the possession of the raiser, by the great hail-storm that occurred on the south side of the Thames a few years since, with the exception of a pair of plants that I had.

Lightbody's Richard Headley.—This is a very regular flower, of first-rate properties, the pip being round, and perfectly flat; it stands long in bloom, the pip being very thick. The plant is of robust habit, and beautiful foliage. The foot-stalks are rather short—consequently requires thinning in time, to form a perfect truss.

Among the White Edges, there were few conspicuous blooms. The following were in very fine condition, and particularly attractive :—

Cheetham's Countess of Wilton.—This variety makes only a small green plant, totally wanting the farina on the foliage, that makes the most of the White Edged flowers so striking. The pips of this sort are perfect, but small; and, when well grown, one of the best for show.

Ashworth's Regular is another of the small plant tribe, but the flower is well named; being regular in its properties, and forms a fine truss of medium-sized pips.

Summerscales' Catharina.—This variety is of robust habit, the foliage white. The flower is very beautiful, the pips being large and the proportions equal. Sometimes some of the pips are elliptical, and when kept too far from the glass, the stem is weak.

Lightbody's Fair Flora.—This makes a stout and handsome white plant, with a tall and stout flower stem. It has an extra fine tube, paste dark ground colour, and edge equal. It forms a fine truss, with a bold guard-leaf behind, which gives it a grand appearance. Notwithstanding the size of the plant, the pips are only of medium size.

Lee's Earl Grosvenor.—This is another of the white-foliaged varieties; it is now an old sort, but when it blooms in character, not easily beat; it is rather late of coming into bloom, but stands long. The pips are large and regular, as well as round and flat; it has a strong stem, and take all its properties into consideration, one of the best of the White Edges.

Campbell's Robert Burns.—This is another of the gems among the White-Edged class; it has a beautiful violet ground colour; it is a late sort, and in a cold season hard to open. The habit of the plant is good; it does great honour to our country that this extra fine variety was raised by Mr Dugald Campbell, gardener to Sir John Pollock.

Lightbody's Countess of Dunmore.—This is a new sort with white foliage, and of robust habit. The pips are of medium size and very regular; it has a very fine tube, with black ground colour; it is a profuse bloomer, and the pips require to be early thinned; it forms a fine truss; it has one drawback in hot seasons; the pips incline to reflex.

Wild's Bright Phæbus.—This makes a stout green plant; the flower stem is tall and strong; the pips very large; the ground colour is black, but too broad, while the edge is too narrow to constitute a show flower. With this great fault, as well as the pips inclining to cup. The great size of the truss makes it singularly fascinating on a stage.

Selfs were exceedingly fine last bloom, and form a pleasing contrast on a stage. Amongst the finest of this class were several raised in the vicinity of Dundee, and which do great credit to the raisers. The finest in my opinion is

Spalding's Blackbird.—This was truly magnificent; the pips are

quite round and flat, and of extra size; the tube and paste are perfect; the colour very dark maroon, nearly black. The plant is of robust habit. With all these fine qualities the stem is weak, and requires to be kept near the glass, otherwise, it must have support.

Spalding's Mary Gray.—This is a semi-white plant, of robust habit, with a tall and stout stem; in quality it is not equal to the former, but still it is a sure show flower; the colour is a dark crimson.

Martin's Mrs Sturrock.—The foliage of this variety is white; it makes a medium-sized plant; the tube and paste are fine; the pip a perfect circle, and quite flat; the colour is crimson. This is a fine show flower, when the pips are of average size.

Martin's Eclipse.—The foliage of this sort is semi-white; the plant is of good habit when it can be got from a healthy stock, but too often it is found liable to take disease. The stem is tall and strong; the colour purple, with fine paste and tube; the pips round and flat.

Smith's Mrs Smith.—This is a very robust sort, forming a large plant; the paste is good, but rather angular; the pips are round and flat, and stand long in bloom; the stem is strong, and for long it was esteemed as one of the best; the colour is purple.

Sim's Eliza.—This is a very beautiful purple self, with fine tube and paste; pips round and flat. The plant is of small habit; the foliage semi-white.

Netherwood's Othello.—This variety is considered in the south to be the very finest. The colour is dark maroon; pipe round, with fine paste; the habit of the plant is robust. Any person wishing to show this sort on a given day would require to grow a score of it, for after it has been in bloom for a day or two at furthest the pips reflex.

Sim's Vulcan is a white plant, of robust habit, the colour is nearly black, fine tube, and paste. The pips of this flower are extra large (forming an extraordinary truss), but they are wanting in smoothness, and are inclined to reflex.

Barker's Nonsuch.—This is a fine self, of a dark blue colour, approaching to purple, the tube and paste is correct; the pips are large, and inclined to cup; the foot-stalks are rather short; early thinning of the pips must be resorted to to form a regular truss; the habit of the plant is good.

Lightbody's Meteor Flag.—The foliage of this variety is white, the habit of the plant robust, the tube and paste fine, the colour, when the bloom is young, is light blue, which darkens as it ages; it stands long in bloom. The finest pair of Self Auriculas that I ever saw staged were Blackbird and this variety. They were shown last year at the Bridge of Allan Show, by Mr James Niven of Keir. Nothing could excel them for quality, and size of pips, and forming a striking contrast.

NEW ROSES.

BY MR W. PAUL, OF THE CHESHUNT NURSERIES, HERTS.

THE Rose bloom of 1857 is over ; here and there only a straggling bud, battered and torn, lifts its head in defiance of wind and weather ; the tired plant yields even then a poor subsistence, for the season's work is over, and the plant longs to enter upon its winter's sleep. Now, while the flowers are fresh in memory, it would seem a convenient time to take a retrospective view of this interesting and popular family of plants.

We may fairly say at the outset, that the season has been a good one ; the plants generally have grown and blossomed well ; the new kinds (when judiciously chosen) have raised the character of the Rose as an ornamental shrub, and demonstrated that, however great the improvements during the last few years, there is yet a wide field open for the exercise of thought and manual labour. A few of the old kinds are still unsurpassed ; some, though still good, scarcely maintain the position hitherto assigned them ; while others are fairly eclipsed by the rising race of beauties, and this is no more than might be expected as the result of labour intelligently applied. The flowers which adorn this beautiful earth are so constituted by a wise and beneficent Creator, that they assume new proportions and varied tints beneath the fostering care of the cultivator ; and while *many* arise similar or inferior to those which have gone before, *some* there are which surpass them in symmetry of form, in colour, and in the various attributes valued in garden flowers. Here is the true poetry of Rose culture ; this is the reward for labour. It is surprising that any one who has watched the progress of the Rose and other flowers should have doubted this, or have presumed to announce that we have reached a point beyond which it is hopeless to look for improvement ! I boldly assert that there is no data from which to draw such conclusions ; the history of Floriculture directly negatives such an hypothesis. Can the advocates of this theory point to any one flower which has reached perfection in the hands of the improver ? I trow not. One man may labour for years, and in his self-sufficiency sit quietly down on *what he considers* the topmost round of the ladder ; but as he looks down admiringly on what he has done, rather than upward on what remains beyond, another takes up the work, and proves at once the fallacy of his conclusions, and the illimitable resources of Nature. Who will tell me that the ideal in Floriculture is fixed and absolute ? From the nature of the art, from our mental constitution, it surely cannot be so. An ideal Rose, conceived from Nature and experience, may exist in my mind, but the moment it is realised I will imagine one more beautiful. Here again is the poetry of the Rose. Take the colour of Lord Raglan, the fulness of Madame Vidot, the outline of Coupe d' Hebe, the fragrance of Joan of Arc

the foliage and habit of William Griffith, and blend their separate points of so-called perfection in one flower, produce it before my eyes, and I will yet conceive an improvement on it. In a word, the ideal continually recedes as we advance.* I deliberately give utterance to the opinion, that far from the Rose having reached its culminating point in the hands of the improver, such improvements will take place during the next few years as will surpass the expectation of its most sanguine admirers. And, as I find your Journal read by most of our scientific and practical Horticulturists, I may, perhaps, without fear of becoming tedious give the data on which this opinion is founded.

The genealogical tree of the family of modern Roses has, so to speak, *many separate and independent trunks*, unlike the Hollyhock, the Dahlia, and many others, which are the offspring of a solitary stem. Look at the original forms of the Provence, the French, the Damask, the Alba, the Macartney, the Microphylla, the Austrian Brier, the Scotch, the Multiflora, the Boursault, the Ayrshire, the Sempervirens, the Indica, and others. These, it is well known, are considered by botanists as distinct species. But they are found to hybridise, and the hybrids so produced may be again intermixed with other hybrids. Thus not only have we a multitude of distinct starting points from which to work for improvement, but the offspring is found to blend and intermix with wonderful facility. *Thus, a point gained by thoughtful industry, often reveals something beyond, previously hid from our view.* Take an illustration of this in the most popular group of Roses known as "Hybrid Perpetual." The progenitors of this group are on the one side the "Monthly," on the other the "French or Gallica" Rose. Now, it cannot for a moment be supposed that the most far-sighted hybridiser of the olden times could penetrate the mysteries of nature so far as to foresee in the almost colourless Monthly Rose, the germ of such kinds as Souvenir de Reine d'Angleterre and Lord Raglan! Nor in the semi-double flimsy petalled French Roses would he have thought of La Reine or Madame Vidot! But it should ever be remembered that these results have been brought about mainly by patient thought and skilful manipulation. Leaps there may have been, as in the case of the Rose du Roi, but they are exceptions which prove rather than negative the rule—the rule in horticulture is patient labour and gradual improvement. The "Monthly" Rose hybridised with the "Damask" gives the "Damask Perpetual." The "French" Rose hybridised with the "China" gives the "Hybrid China." The "Hybrid China" crossed with the "Damask Perpetual" gives the "Hybrid Perpetual." Here we have new ground broken by the horticulturist, and ground which has astonished every one by its apparently inexhaustible fertility. Just compare some of the first "Hybrid Perpetual" Roses known as "Princesse Helene," "Marechal Soult," and "Lady Fordwich," with the long line of

* See Cousin on *The Beautiful*.

succession annually forthcoming, and see how gradual has been the order of improvement.

Now that which has happened within the last few years to produce Hybrid Perpetual Roses may be repeated with endless variations till not only new varieties but new groups shall arise, surpassing even the Hybrid Perpetuals as far as they surpass their progenitors in fragrance, in durability, and in beauty. Let me remind the most critical connoisseur that within the last three years he has obtained, among other valuable varieties, a Hybrid Tea Rose in Gloire de Dijon, which far excels all its congeners in every desirable point. And let me ask him whether every year does not bring forth some new variety so curiously intermixed that he knows not to which of the old groups he can consistently refer it? Of course he knows that some of our modern Roses are related by blood or marriage to *several of the original species*; and knowing this, does he doubt their capability of variation and improvement?

This brings me to the somewhat difficult and thankless task of saying something about the new Roses of the present season. The new Roses, when they arrive from the Continent, are often small plants, and they suffer so much in transit, that it is difficult to draw positive conclusions as to their merit from the few weakly flowers of the first season. Hence, the data being insufficient, the conclusions are more or less guess-work; and it always must be so when dealing with the newest kinds. We shall, however, not shrink from the task, but fearlessly record our opinions, which have been, at least, honestly gathered from the facts which have come under our notice; and as the same pains have been bestowed as heretofore, we may perhaps be justified in hoping to attain the same general results. Among the Hybrid Perpetuals are:—Adelaide Fontaine, flowers pink in the way of Louis Peyronny, but larger, more double, and apparently a better grower. Belle Angevine, flowers white, distinctly striped with rose of lilac. Cardinal Patrizzi, flowers brilliant red; shaded, dark, and velvety; large and fine. Felix Peretti, flowers flesh colour; very large and full, also very sweet. Gustave Coraux, flowers bright purple, dark and distinct; produced in great abundance. Mademoiselle Therese Appert, flowers delicate rose, beautifully cupped, large and full; also produced in great abundance. Mademoiselle Alice Leroy, similar in colour to the preceding. Madame Heraud, flowers bright carmine, large and full, very sweet. Ravel, flowers scarlet crimson, finely formed, large, and full; blooms freely. Standard of Sebastopol, flowers blackish crimson, very velvety; growth vigorous. Victor Trouillard, flowers scarlet and crimson; shaded, very large, and showy, but a little coarse. There are two Bourbon Roses only worthy of especial mention. These are—Etoile de Gironde, flowers cherry colour, shaded with violet, large and full; and Georges Dupont, flowers brilliant crimson, shaded with glossy purple, large and full. In addition to the beauty of their

flowers, it is worth recording that they appear to be of more vigorous growth than the old kinds, Charles Souchet, Souchet, &c. Among Noisette Roses we have Madame Masson, certainly a gem of the first water. The flowers are small, produced in large clusters, of exquisite shape and colour; the margin is white, the centre delicate flesh colour. Then there is Madame Schultz, apparently a charming Rose in the way of Lamarque, excepting that its primrose flowers are often shaded with carmine; the growth is vigorous, the fragrance delightful. Miss Gray, or Isabella Gray, though a new Rose, is already well known, but not so favourably known to me as many other new kinds; although I introduced this Rose from America, and have had it growing largely in the nurseries for three years, I have never recommended it. The colour is beautiful, but the flower-bud is so hard that I fear it will not expand except when grown in a moist heat. Triomphe de Rennes is worthy of a place in every collection; the centre of the flower is bright orange yellow, the outer petals cream-colour; the flowers are nicely cupped, expanding finely; and the growth is vigorous. Although apparently quite hardy, we should recommend this and the two previous kinds for climbing Roses in the greenhouse or conservatory.

There are some new Tea-scented Roses which ought not to be passed over. Amabilis is a vigorous-growing kind, with large and full flesh-coloured flowers. Belle Marie also promises well; the flowers in this instance are white, shaded with rose colour, large and full; the petals are thick and fleshy, the bud perfect. Madame Lartay is a new yellow Rose, shaded with salmon; the flowers are large and full, the growth vigorous. Madame William produces flowers of a rich orange yellow, much in the way of Eliza Sauvage, but apparently of a hardier constitution, and more vigorous growth.

There is a taste for Perpetual Moss Roses at the present time, which it is not my province to question. To those who are unacquainted with them it may however be said that one of three great faults at present attends almost every variety—the flowers are small and thin; the constitution is almost hopelessly delicate; or, paradoxical as it may appear, they are not really autumn bloomers. Two of the best novelties here are Abel Carriere, flowers bright red, shaded with violet, blooming in clusters; and Empress Eugenie, flowers bright red, small and pretty; of good form, and full, but apparently delicate.

These are, in my opinion, the list of the new Roses of the present season; some may possibly improve in character with another year's growth, others have doubtless already done their best; but, judging from past experience, I have no doubt that those who purchased these will have a good lot of Roses.

It is now nearly a year since I gave a list of 12 proved new Roses in the *Gardener's Chronicle* (see also the *Scottish Gardener* for January last), with the view of guiding purchasers in making a selection. They are as follows:—Hybrid Perpetuals—Genera

Castellane, General Jacqueminot, Gloire de Vitry, Lord Raglan, Madame Desiree Giraud,* Madame de Cambaceres, Madame Masson, Madame Martel, Madame Vidot, and Souvenir de Leveson Gower; Bourbon—Prince Albert; and Tea Scented—Gloire de Dijon. In reference to these I have only to say, that the experience of another season has brought corroborative testimony in their favour. Let me then pass on to the new kinds of promise, *not proved*, which I venture to recommend as worthy of trial. They were—Arthur de Sansal, Bacchus, Dr Henon, General Simpson, Imperatrice des Francais, Mathurin Regnier, Madame Knorr, Ornement des Jardins, Pæonia, Prince Noir, Souvenir de Reine d'Angleterre, Triomphe de l'Exposition, Triomphe d'Avranches. It will doubtless be remembered that I stated there was some uncertainty in this list, arising from the imperfect data on which it was framed. But what are the facts? Twelve out of the thirteen kinds then recommended conditionally, have proved good Roses. And here let me add two or three others, of whose merit I was doubtful at the time, but which have flowered during the past season to my entire satisfaction. Hybrid Perpetual—Pauline Lansezeur; Bourbon—Empress Eugenie, Marquis Balbiano, and Omar Pacha.

But I must close, I fear my matter-of-fact communication is already too long. It may be said, and with justice, "There is no poetry here." But surely the poetry of the Rose does not legitimately lie in its commerce! True, it may be brought there, as is alas too often the case, and not only in horticulture, but also in the higher departments of literature and science, in history, in law, in physic. But are not the flowers of rhetoric oftener used to conceal than to elucidate truth? And does not the cause of truth, of justice, of humanity suffer in consequence? It has always appeared to me that horticulture is a practical art, that the soundest practice is based on facts. I could not soar into the regions of fancy in search of pretty phrases with which to decorate my Roses, without expecting on my return to the sober paths of business life, to find my poetry styled exaggeration. We horticulturists are, or should be, humble devotees at the shrine of truth. We have to deal with the real more than with the ideal, and the moment we quit the broad and ample fields of observation and experiment to wander in the trackless regions of fancy, we are in danger of setting up a "light that leads astray," instead of "light from heaven."

* Mr Rivers, in his Catalogue of last year, states this to be the same as Panache d'Orleans, a mistake which could not have occurred had he spoken from observation; for not only are the flowers different, but the leaves, shoots, and general habit so much so, that they may be distinguished by the most cursory glance. Yet on this misconception he brings a charge against the Belgians of selling an old Rose, under a new name, at a high price!—W. P.

LESCHENAULTIA FORMOSA.

BY MR J. ANDERSON, GARDENER, MEADOWBANK, UDDINGSTONE.

WHY have gardeners such a tendency to dilate upon the merits of the *Leschenaultia*? It is simply because it has an elegant habit—if well managed it flowers densely. The colour of those flowers please the eye; the foliage is graceful and vigorous, and perhaps a little is attributed to what some people term the extraordinary skill required in its successful cultivation. I would not be inclined to join in this outcry; if I might draw a comparison, I would say that it can be grown to specimen size, with as little attention, with as little care, and in as short time as one of those pretty little "*Fancy Geraniums*." I may here state, from practical observation and experience, that you can grow a specimen *Leschenaultia* 2½ feet high by 2 feet broad in three years from the time you insert the cutting. Can you grow a fancy *Pelargonium* much sooner?

Well, then, to the practical management of it. You cannot go far wrong with the selection of your cuttings, if you have a vigorous parent, that has had previously full exposure to sun and air. You may cut them off from three to four inches long—if a branching cutting all the better. It is nothing but a loss of time "nibbling" with shoots two inches long, almost substanceless, consequently damping off more readily, and requiring more watering with the pan. I have learned it as a rule, that the less watering after insertion, until "striking," the better, so that the position for your cuttings ought to be determined by a salutary moist medium. They can be inserted in autumn or spring successfully, their foliage cut close to the stem half length ways with a sharp budding knife; having previously prepared 6-inch pots, with a stratum of pot shreds, next sphagnum or rough fibry matter, then fine sifted peat and sand in about equal parts, and lastly one inch and a-half of pure fine sifted silver sand. If the above mixture is in a proper state of moisture, give no water until the cuttings are inserted; after insertion, water with a fine rose—this will fill up all crevices and settle the compound in such a manner as to exclude air, in all cases detrimental to cuttings—cover with a bell glass, occasionally wipe the moisture gathered within it, the autumn cuttings remaining in their pots till early spring, the spring ones at least eight weeks, before offering to handle them. The anxious cultivator, especially at the outset, is apt to sacrifice a number of things in this way by trying them too prematurely. Patience and vigilant attention are necessary, and Nature's laws will supply the rest. They must have no dung heat—a system of coaxing for propagation, which, in a number of cases, only tends to make them live out a miserable existence. The top shelf of a house, greenhouse temperature, shaded from mid-day suns, will suit your purpose well—the modified light and temperature

giving a sturdy foundation to your young plants. The cutting pots may, after the above specified time, be inverted—the entire soil will be found replete with rootlets; these must in the most careful manner be separated, potted into thumb-pots in a mixture of peat and sand, placed afterwards near the glass, having light and air on all favourable occasions.

There are two things, however, absolutely necessary for their successful cultivation. The one, never to allow them to get “pot-bound,” or even approaching to that condition; the other, to stake them well out, so as to allow air to pass freely through the plant, to prevent damping off—that dreaded impediment to their more universal cultivation.

You will soon have the thumb-pots full of roots, and the plants ready for re-potting—a very easy matter to re-pot one would think? They may now have five-inch pots, introduced into these among an ingredient of fibry peat, with a good sprinkling of roughish silver sand; take a small handful of the lumpy peat, place it over your already crocked and sphagnumed pots, put in the plant, fill up with the compost, water in a day or two, and in three or four weeks you will see the roots at the bottom of the pot. This plant roots freely in a proper mixture. Lead up a centre stem to a stake, divide out the other branches as nicely as possible, keeping them growing upwards; pick off any flower buds, forming at all times, until your plant is of some dimensions. It requires no topping or shortening of the shoots; on the contrary, it must be staked up. If you have stone tables, place the pots on them; it keeps them cool in summer, and does them no harm in winter. Air freely at all times; syringe every morning during spring and summer; keep them in a rather shady part of the house during the hottest part of the summer. Never let them suffer for water, but don't saturate them on any account; as this decomposes the soil, materially injures their vigour, gives them a frail constitution, that would soon become a total sacrifice to the wearing out theory.

They will require, if growing vigorously, three shifts during the season; at all events they must have two, staked anew at every shift, and particular care must be taken at the September one. Stake the plant in such a manner that the shoots may stand clear of the pot and of one another, for it is the accumulation of moisture without air circulation that causes limbs of them to damp during the raw wintry months. Keep them a foot or so from the glass, fully exposed to sun. Render them hardy by admitting currents of fresh air, although it is not advisable to keep them in a house under a minimum of 36°; attend to this and you will neither have mildew nor damp to contend against. Water must penetrate through the entire ball when given, and not be served out in dribblets. Continue disbudding the flower buds; the vigour of your plants will increase, and in their third year you can flower them during spring or summer at any given time, rendering this a first-rate plant for

exhibition or other ornamental purposes. The duration of its existence is comparatively protracted; yet a supply must be kept up every year, which any person can manage who determines to have by dint of perseverance a few good plants of this pretty crimson favourite.

L. Biloba seems to be far more difficult to manage. I should be glad to see some of our English metropolitan exhibition growers giving us a paper on this plant, as it is seldom seen fine in our Scotch collections.

A FEW WORDS ON THE CULTIVATION OF CARROTS.

BY MR PETER MURRAY, TAYMOUTH GARDENS.

To secure a good crop of Carrots is a subject on which much has been said and also written; but, year after year brings forth many disappointments, not only to the anxious cottager, but also to too many good practical gardeners.

Having had ample experience on "both sides" of this vexing question, I now avail myself, through the medium of our cornucopia, the *Scottish Gardener*, in giving a few practical hints of my experience.

It is a proverbial fact that in gardens where the soil is, as it were, sickened by manure and the repeated crops of vegetables, Carrots can rarely be depended upon; such, however, was the soil on which I, in common with many others, failed; but, bidding defiance to despair, I tried and tried, and tried again, varying of course in every move, till at last I succeeded in striking on the right vein, as follows, viz. :—My first step in the right direction was, that in one portion of ground where I succeeded, in another I as signally failed, while at the same time both got the same treatment, and sown on the same day. The first ray of hope then flashed to my mind that the ground whereon the successful crop grew was manured and trenched in the month of November, while the other was only prepared in March, or immediately previous to sowing the seed.

Thus far, I repeatedly experimented on this point, until I was completely set at rest on the utility of autumnal trenching, and to which I have strictly adhered for the last twenty years.

It may be as well to state that the sort of manure I use is chiefly decayed hot-bed dung, with a good portion of vegetable mould from decayed vegetables.

It is arranged that the previous crop of whatever sort it may be, is cleared off in time for trenching, which ought to be done in October, or at the very latest in November—taking advantage of dry open weather, and not when the ground is either saturated with rain, &c., or crusted with frost.

It may be said, what? there is nothing new in this! I also should have said so at one time, but the secret seems to lay in that

the soil being by seed time consolidated by the rains and snow of winter, while spring preparation of the soil leaves the ground too porous and open, and decidedly unfit for the production of a healthy crop of Carrots; or whether the open state of the soil is an inroad for the worm, or its parents, is a query still to be solved.

I should not omit to mention that I sow our main crop from the 15th to the 25th of April, and immediately before drilling off the ground (which I do at 15 inches apart), the surface of the soil is simply levelled with a rake; drilled about an inch deep, with a simple machine we have for drilling; seed sown, and afterwards covered in, and firmly trod with the foot.

For an early crop there is none to surpass the "Early English Horn;" it is preferred to all others for the "table," and to grow them small enough is a desideratum.

My method is the following—in February, or as soon as the ground is in working order, I mark off the ground, after a slight levelling with the rake, into four feet beds, on which the seed is sown rather thick. I then cover over with about an inch of common road scrapings (kept dry for the purpose), beating off firm with the back of the spade.

In regard to thinning, these I never thin, leaving them undisturbed, with the exception of keeping them free from weeds; they thus get finally into a solid mass of enviable little "minnows," averaging two inches in length.

In commencing to draw, we take them right before us, as thinning after they get the form of a Carrot is the highway to ruin the crop.

By the above I do not mean that no Carrots ought to be thinned. On the contrary, I thin our main crop for winter use so soon as they can be handled, to 5 or 6 inches apart in the drills. By thinning very early, the plants are not drawn, nor constitutionally weakened.

The Altringham I prefer for a main crop, and in hurriedly passing by, I may state that I have found this variety suit admirably for transplanting, *i.e.*, if they are taken just when they are entering into the third leaf from the seed; they, of course, must be raised up very carefully (not drawn), so as not to fracture the tender fibre.

Should the above hints be the means of drawing the attention of any of the readers of the *Gardener*, who may have been unfortunate in securing a store of the above useful, I may say everyday vegetable, so that they may get their ground in order without delay, is the sole object of my intruding on the valuable space of this publication.

FURNACE BARS.

I have been much interested, from time to time, with the articles that have appeared in the *Scottish Gardener* upon heating, as it is applied to horticulture. Your correspondents have shown that,

although they did not at all times see uniformly, they understood the subject upon which they have written.

Now, I wish to ask a question, through the medium of your pages, in reference to bars. The question arises out of a conversation which took place between a mechanic and myself just lately. The bars in one of my furnaces are one inch thick with projections at each end, and in the middle, of a quarter of an inch ; so that a quarter of an inch cavity exists between each two bars, for the admission of air to the fire. The mechanic, on seeing them, asserted that they were far too thick, and said that if they were only one-half the thickness, they would last much longer than they will under present circumstances. I could not understand how it was that a piece of iron half-an-inch thick would last longer than a piece of iron one inch thick. We held a short argument on the subject—during which he said something like the following:—Thick bars absorbed a much greater amount of heat, and that they retained it for a much greater length of time than thin ones. Of course they do ; but does that argue that they will be much more quickly worn out than thinner ones would be. He being a man much older than myself, and one that has had a considerable amount of experience in such things, I did not continue to oppose him, but resolved to transfer his opinion to the pages of the *Scottish Gardener*, for the consideration of those who are much better qualified to give the opinion than myself. If some of your correspondents will take up the matter, and give your readers the results of their experience on it, it will help to decide the point at issue.

T. J., Manchester.

STRAWBERRIES FOR EARLY FORCING.

To get a stock of Strawberries for early forcing, select as many vigorous plants to propagate from as may be necessary to produce the required number of young plants from the finest of those forced in May. They should be allowed to produce their runners as soon as the crop is fit to gather ; peg the runners into small pots as soon as the young plants are formed, and attend to them carefully with water at this early stage of their growth to hasten the formation of roots.

When the required number of plants are obtained, and the plants well established in the pots, they may be shifted into their fruiting pots, and inured to exposure by being hardened gradually in a cold frame. By this plan fine strong plants for early forcing may be obtained, and of any required age, by rooting the plants from earlier or later successions. This plan of raising young stock might be made available for autumn forcing as well as early spring, by propagating from plants forced in January and the succeeding months, and numbering the several successions first, second, third,

and so on, to prevent their getting mixed. These plants by good management would be strong enough to produce fruit in autumn, so as to keep up a supply of fruit for table to November, or during the whole year where the necessary means and accommodation can be obtained. It would be particularly deserving the attention of the gardeners of Scotland to endeavour to have a good supply of forced Strawberries in autumn, since so many of the nobility and gentry visit the North at that season.

A dozen healthy plants as breeders will readily produce eight or ten dozen young plants. This would not interfere much in the way of extra room in the forcing pit.

J. M., Carlisle.

NOTES ON GARDENS.

FAIRFORD PARK—THE RESIDENCE OF J. R. RAYMON BARKER, ESQ.

BY MR A. CRAMB, THE GARDENS, TORTWORTH COURT, GLOUCESTERSHIRE.

Within the last few weeks I have paid a visit to this interesting place, which is situated on the Cotswold Hills, nine miles from Cirencester. Being so much pleased with the beauty of what I saw, and the systematic way by which things are carried on, I offer no apology for requesting the insertion of a few particulars in the pages of the *Scottish Gardener*. I look upon matter of this kind, when materials are fairly dealt with, to possess considerable interest to persons engaged in gardening, as so many subjects are generally handled, some of which cannot but prove useful in some form or other. On the contrary, when the imagination is allowed to invest objects with attributes which they do not possess, then do they become manifestly injurious, and deserve to be treated with disregard.

I think that scenery has been rightly divided, and thrown into five distinct heads, namely, the Grand, the Romantic, the Beautiful, the Picturesque, and the Rural. We cannot set these divisions up as arbitrary standards—at least it would be difficult to do so, as they not unfrequently blend, or shade into each other; hence arises the impossibility on every occasion to decide upon their respective boundary.

Fairford Park partakes of this mixed character, and were I to venture an opinion, the Beautiful appears to predominate more fully than that of any other. The mansion lays no claim to architectural embellishment, but it is a commodiously arranged building, free from a defect we too frequently meet with, of having the servants' apartments and offices in view of the private entrance. As it reposes in a rather secluded situation, a wise advantage has been taken in forming the approach, to give the visitor an opportunity of catching those features of variety with which the park abounds, and to give an idea of extent and magnitude, all harmonising in perfect unison with the soft and polished character of the scenery. No incongruity exists between the style of the entrance lodge and the mansion, which we too frequently find to be the case, and that too where any trace of unity has been totally disregarded. Although to a certain extent they are isolated, we dare not indulge in an abstract conception, the laws of proportion forbid such toleration, and everything that tends to create an uneasy feeling should be sedulously avoided.

I made no strict inquiry regarding the size of the park, but it appears to be large and well stocked with deer. The extreme boundary is protected by a fosse and iron rails, which allows the eye to travel uninterrupted, and is more pleasing than an opaque fence. The waving outline of the pleasure

ground harmonises with the scenery of the park, and its internal arrangements show that no mark has been overcharged; no hard angles offend the eye, the walks have been kept out of sight of each other to destroy all idea of limitation, and the trees and shrubs have been so happily arranged as to resist the intrusive gaze, the overpowering heat of summer, and the biting winds of winter. A large lake, nearly half-a mile long, skirts one side of the dress ground, with its marginal walk threading a tortuous course among lofty trees, holding the mind in a state of constant anticipation. The idea of continuity at the extremity has been worked out effectually by judicious planting, a point too often neglected, or at least not sufficiently cared for at all times. Here the river Colne empties itself over a cascade, which has a pretty effect at a distance, and particularly when the river is the least overcharged. Rarely do we see so beautiful a piece of water contiguous to a gentleman's residence so pure and uncontaminated as exists at Fairford Park; the only parallel cases that I can think of is at Bowood and Longteal.

The flower garden is situated in the middle of the pleasure ground; the design is good; the figures are laid down on grass, and all radiate from a common centre. Judging from the plants, and the manner of their arrangement, the effect must have been pleasing; but from being damaged by rain, it is scarcely possible to form a correct opinion.

In closing this part of my notice, I cannot omit saying that, in laying out these beautiful grounds, the artist has had few natural advantages to assist him—no unconformable, contorted, unstratified, and disrupting masses of rock to lay his hands on; the conception is one of much ingenuity and a cultivated taste.

The kitchen garden adjoins the pleasure ground. It covers an area of three acres, enclosed by a substantial brick wall, 12 feet high, and is divided in the centre by one of the same height; the line of glass houses is 150 feet long, containing four vineries, a plant stove, and a house for the growth of miscellaneous plants. There is also a fruiting Pine stove, 45 feet long, a house for successional plants, and one for winter Cucumbers.

I did not observe in the vineries anything to call for special notice, unless a house of excellent late Grapes nearly coloured—the early crops being almost over.

The plant stove contains a good collection of plants, but perhaps too much crowded to render them effective. I noticed a large quantity of *Pancratium amureum* and *Caribæum* in first-rate condition; an *amaryllidaceous* plant, and as these species flower during September and October, they are the more valuable, and particularly so owing to their agreeable perfume. They are strictly stove plants, yet the flowers remain long in perfection in a cool drawing room. My attention was drawn to a Cape of Good Hope bulb in flower, said to be *Disa grandiflora*, of which I feel rather sceptical; but not being intimately acquainted with that genus, I feel no inclination to push my opinion too far. I find in botanical books that it is described as a ground orchid, but I did not observe it to possess any characteristic peculiar to that class of plants.

I have seldom met with a more valuable stock of fruiting Pine plants. We may occasionally see them of a larger size, but that of itself does not constitute quality. We often hear it said of gardeners who surpass their neighbours on any point, that they possess "particular advantages." But here, in the case of soil, no person can labour under a greater disadvantage than Mr Parr, and he tells me that he overcomes its tenacity by the use of peat earth and wood ash. The diameter of the pots does not appear to be more than ten inches, yet fruit of the Queen variety is produced above four pounds, and the Cayenne five pounds. It may appear that there is nothing extraordinary in this, which I freely admit, but to carry a consecutive course, shows Mr P. to be no tyro in Pine cultivation. It is with the fruit of the Pine, as that of any other, size does not depend so much upon the number, as the activity of the roots, hence it will be easily understood why Mr Parr's small pots throw so large fruit. I have nothing to say against large Pines; let us have them by all means, but not at the expense of flavour. I

have a hundred times heard gentlemen complain of large productions being deficient on this point, and I have no doubt of the complaint being perfectly just nine cases in ten, from the fact that a greater intensity of solar heat, light, and chemical power, the latter of which is sometimes called actinism, to transfer the larger mass of acidity into sugar, than what is common to this country.

The management of the wall trees is good, a department which has for many years past engaged a large share of Mr Parr's attention. The only point from which I am disposed to differ from him is in the preference he attaches to the fan method of training Pear trees, which I find produces an accumulation of sap at the extremity of the trainers, leaving the centre in the course of a few years unproductive. The horizontal plan precludes this objection, by producing a more uniform distribution; but what is a difficulty to one person, becomes to another a matter of ease and certainty.

However much we may differ in regard to the training of Pear trees, I most willingly acknowledge the excellent condition of his Peach trees, as regards their health and quality of the crop. Whenever the wood becomes too gross, Mr Parr has them lifted; the roots brought near the surface, to prevent the production of plethoric wood, which, although it may form fruit buds, rarely or ever fructifies.

The fruit trees of the walks are not allowed to extend above four feet high, which is an advantage to the vegetable crops, and yet they fruit profusely. Low trained espalier Pear trees cross the squares, and produce a great deal of fruit at a small sacrifice of ground. The kinds principally grown in this way are Beurre, Easter, Chaumontel, Ne-plus Meuris, Maria Louise, and Beurre de Capiaumont—not at all times of first-rate flavour.

When passing from Cirencester to Fairford, I observed a number of Apple trees as full in flower as if it had been the month of May. The only reasonable explanation I feel competent to offer for the production of so unusual a phenomenon, rests purely on the principles of premature organisation, or perhaps more properly speaking, on the early maturity of the wood. On the 14th of August a most terrific hail-storm passed over that part of the country, destroying the Apple crop. Calculating from the high mean temperature of the summer, fruit buds must have been matured previously on the current year's wood; and, from a continuance of heat and undiminished vital activity, the buds were pushed into flower, accelerated by the loss of the crop. We cannot suppose them to be latent buds of the preceding year.

CULTURE OF THE VINE IN FRANCE.

FONTAINEBLEAU AND THOMERY.—We reached Fontainebleau March 12, about noon. The inhabitants say its name is a corruption, by contraction of *Fontaine-belle-eau*—there being fine springs of exceedingly pure water at this place and its vicinity; doubtless from being filtered through fine sand, which is said to be valuable for making flint glass. Snow commenced falling thickly in broad flakes, so that we only saw the water in a comparatively turbid state, from the influx of the former.

Notwithstanding the unfavourable state of the weather, M. Souchet, of the Royal Gardens at the Palace of Fontainebleau, had the kindness to conduct us to the vine-walls, which are under the management of M. Brassis, *jardinier en chef du Parc et de la Treille du Roi*, at Fontainebleau. Part of the wall has an eastern aspect, and is about 20 feet high, forming the wall of barracks. More recently built, a long extent, with a south-east aspect, is 12 feet high. The whole length is 1400 mètres, or 1531 yards—nearly 7 furlongs.

Part of the wall, where highest, is occupied with Vines planted 2½ feet apart; but this was said to be too close. These were trained with a single upright stem, with the bearing shoots diverging from both sides—*en palmette*, as the mode is termed—or like the leaf of a Palm. The leafstalk and leaflets

of the *Cycas revoluta* afford an example of the manner in which the bearing shoots are trained from the upright main stem; or the same may be represented by fish-bones. The bearing shoots were not strong, but firm and well matured; they were about 2 feet in length; and at the winter pruning they are cut close to the lowest eyes. The upright leading shoot is cut to three eyes when the plants are young, but as they get older it is cut to only two.

Where the principle of the Thomery system, *en cordon*, has been adopted, the plants are here 3 feet apart. Each plant as at Thomery, has only one horizontal branch to the right and another to the left, forming the cordon; but at the Fontainebleau each of these extends 6 feet; at Thomery only 4 feet. The cordons formed by the horizontal branches are about 2 feet apart. With regard to the comparative merits of these two modes of training, there was no decided opinion. The first, with the bearing shoots diverging from an upright stem, is the more easily managed; but, in this country, it is questionable whether the eyes on the lower part of the stem would push sufficiently well; for in vineries it is sometimes necessary to bend down the upper part of Vines trained upright, in order to ensure the pushing of the lower eyes.

The soil where the Vines have an eastern aspect is naturally unfavourable, and rather wet; in fact, it was so bad that it had to be dug out to the depth of 2 or 3 feet, and replaced with better soil, mixed with some leaf-mould. Manure occasionally afforded, consists of a compost, of equal portions of horse-dung and cow-dung, and turf-parings, in alternate layers, turned several times over before being applied. Dung alone has been tried, but the compost was found preferable—the quality of the Vines manured with it being much better than where dung only was employed. Along the portion of wall facing the south-east the soil is of a more favourable nature.

The Vines are tied to wooden trellis-work. The wall is furnished with coping, projecting about a foot. Both here and at Thomery, projecting copings are considered of great importance: in England they would doubtless prove equally beneficial. Under glass, projecting like a coping, it has been proved that Grapes ripen, colour, and retain their bloom, much better than they otherwise do on the open wall.

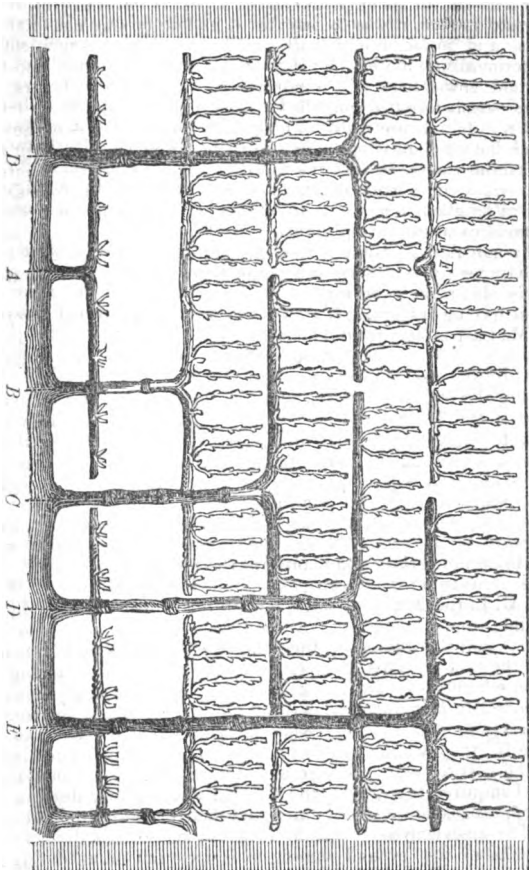
M. Souchet having ascertained that there was an intelligent *propriétaire cultivateur*, M. Larpenteur, from Thomery, in Fontainebleau, he intimated our object to him. M. Larpenteur accordingly undertook, very obligingly, to conduct us by the nearest route through the forest to Thomery.

On reaching the outskirts of the forest we found ourselves considerably elevated above the Seine, and had then a good view of the village of Thomery, stretching along the side of the river and the base of the slope; and of 600 acres of walled enclosures for the cultivation of the Vine. Such an assemblage of walls is perhaps nowhere to be seen, if we except Montreuil. It appeared as if the walling-in system was proceeding upwards to the precincts of the forest. Plantations of Vines, in the open vineyard mode of culture, were seen verging close upon it, almost in proximity with the common heath, which grows abundantly in the forest.

From this locality Paris is largely supplied with Grapes. We were informed by M. Larpenteur that the quantity forwarded to Paris, by barges down the Seine, from Thomery is not less than 30,000 lbs. daily, during the Grape season; and the quality of the Thomery Grapes is well known to be excellent for the table. This it may be readily supposed is owing to the steep slope on which the Vines are planted. "*Bacchus amat colles*" is a quotation frequently introduced by writers on the Vine; and the south sides of hills are recommended. But what is remarkable in the case of the Thomery Vines, they are not grown on the south side of the declivity, nor does it face the east or west: the ground actually slopes to the north and north-east. I inquired the reason why the acclivity, equally steep in appearance on the opposite side of the Seine, and facing the south, had not been preferred? The answer was, it was found to be too hot and dry. Probably, the circumstance of the ground sloping as it does first induced the inhabi-

tants to commence building walls, in order to counteract the effects of their northern exposure. At all events, we were informed that the walls were first built with the view of affording the Vines an aspect directly south; but this was found too hot. They then tried the south-east, which proved the best point, as regarded the perfection of the fruit. But now, in order to suit the market, or, in other words, their own interest, the cultivators wish to have the walls still farther to the east, or even to face due east. They say there are now so many Grapes brought early in the season to Paris from the south of France that it is more profitable for the cultivators of Thomery to retard theirs till the glut of the others is over.

The different properties form long slips, separated by walls. Interiorly each is subdivided by cross walls, about 30 feet apart. Formerly the walls were composed of clay, plastered over; but they now build them of stone. They are about 8 feet high, furnished with a coping of flat tiles, projecting about 8 inches, and worked up to a ridge-top, in order to throw off the wet. The projecting coping is considered of great importance by the cultivators, on account of its keeping the fruit dry, and preserving the bloom. Wooden trellises are affixed to the wall, and to these the Vines are trained in the following manner:—



Formerly the Vines were planted 4 feet from the wall, and layered till they reached it. This mode is not now strictly adopted. The plants are 16 inches apart. The plant *A* having reached the first horizontal bar of the trellis, which is 6 inches above the surface of the ground, it is there cut at the winter pruning; and shoots are trained from it to form the cordon, right and left. The distance between the cordons is 18 inches; and when the vine *B* has extended so far above the cordon formed by *A*, it is likewise cut, for the second cordon. In this manner the vines *C*, *D*, *E*, are treated at the winter pruning, after they have attained the respective heights. At *F* is represented the mode of introducing a Vine, to form a cordon, from the other side of the wall.

It will be seen that each Vine has two arms, extended in opposite directions; and that their utmost extent horizontally is only 8 feet; whilst the bearing shoots are not allowed to pass the next cordon: consequently, each Vine is limited to 8 feet by $1\frac{1}{2}$ of trellis, or 12 square feet. We had the opportunity of seeing the Vines at Thomery winter-pruned, as in the lower cordon of the above figure; and not pruned as in the four other cordons. At the winter-pruning the upright shoots which have borne the fruit are cut close to the small eyes situated at their bases; and from these eyes, only two shoots are allowed to grow up to bear fruit, to be stopped in summer below the next cordon, cut back, like their predecessors, at the next winter-pruning; and so on for perhaps half a century. We saw some old knotted subjects occupying no more space than that above mentioned, that had been planted by the grandfather of the present proprietor, fifty years ago. Their space indeed seemed ample enough for their apparent vigour. They would certainly form the greatest contrast imaginable with the Vines described by travellers in the East, having stems $1\frac{1}{2}$ foot in diameter, with branches, supported to form a canopy 50 feet in length and breadth, covering 2500 square feet. Yet, on such a portion of wall as is represented by the figure, being only 8 feet in length and as much in height, it is calculated that not fewer than 320 bunches would be produced.

The soil is not rich, nor does it get much manure; only a little when the shoots become very weak, once in three or four years. It is a poor light brown sandy soil, such as would not be supposed capable of supporting anything like a crop of Grapes. We obtained some of it, which has been analyzed by Professor Solly, and gave the following result:—

Analysis of Thomery Soil.

Silica	...	...	...	...	81.0
Alumina	...	...	...	...	7.0
Oxide of iron	...	...	...	...	3.0
Lime	...	...	...	...	1.5
Magnesia	...	...	...	...	0.5
Saline matters	...	...	...	...	0.5
Organic matters	...	...	...	...	3.5
Water	...	...	...	...	3.0

100.0

It may prove interesting to contrast the above with an analysis of the soil in the Society's Garden at Chiswick, by the same eminent chemist, and which was published in the *Transactions of the Horticultural Society*, Second Series, vol. iii., p. 36.—

Analysis of Soil in the Garden of the Horticultural Society.

Silica	...	...	...	...	78.730
Alumina	...	...	...	...	5.182
Oxide of iron	...	...	...	...	8.250
Lime	...	...	...	...	0.640
Magnesia	...	...	...	...	0.107
Potash and soda	...	...	...	...	0.047
Chlorine	...	...	...	...	0.004
Sulphuric acid	...	...	...	...	0.007
Phosphoric acid	...	...	...	...	0.018
Organic matters	...	...	...	...	7.000
Loss	...	...	...	...	0.015

—100.000

It appears from these analyses, that the Thomery soil contains a greater proportion of silica, alumina, lime, and magnesia than the soil in the Society's Garden; but nearly one-third less oxide of iron, and only one-half the quantity of organic matters. The latter circumstance proves that the soil is not highly manured. The manure preferred consists of equal portions of horse dung and cow-dung mixed. The dry soil is easily moistened throughout.

Vines are also trained, *en cordon*, against low espaliers in the ground forming the central plot of the respective enclosures. In some seasons the fruit from these is said to be excellent in quality; but wind and rain often render it unsaleable, except as inferior produce. Some of the espalier Vines were 60 years old, and were even partially overrun with moss. Against a wall 16 feet high, Vines were trained *en palmette*, as at Fontainebleau.

Outside the walled enclosures, in the open ground approaching the forest, Vines were observed cultivated according to the vineyard system. The shoots are trained to stakes in summer; and at the winter-pruning *all* the shoots are cut down to two eyes. The plant then resembles a stumped willow stool. The stakes here employed measured 4 feet 3 inches in length.

The variety of Grape cultivated almost exclusively at Thomery on walls, espaliers, and in the open ground, is the Chasselas de Fontainebleau, which is the same as the Royal Muscadine. The cultivators are particular in propagating only from such Vines as are the most healthy, and which produce the finest fruit. They do not say that such are varieties absolutely distinct from the Chasselas de Fontainebleau; but they do maintain that there is decidedly a constitutional difference amongst the plants. M. Larpenteur had the kindness to cut some shoots for the Society from Vines recently planted against a wall, and which had been propagated from Vines producing the finest fruit growing at Thomery.

We tasted some of last year's crop of Grapes, still fresh. They keep them on broad stages, occupying the middle of an upper story, leaving a passage all round between the stage and the walls. A board along the edges gives the stages the form of a shallow box, in the bottom of which is placed a layer of well-dried Fern, upon which the bunches are laid. M. Larpenteur was of opinion that very dry straw would answer as well as the Fern.

Having seen the mode of training the Vine at Thomery, and received through the kindness of M. Larpenteur, full information respecting its cultivation, we retraced our steps through the forest, and reached Fontainebleau at dusk.—R. THOMPSON, in *Journal of the Horticultural Society of London*.

EXTRACTS FROM THE PROCEEDINGS OF THE NATIONAL FLORICULTURAL SOCIETY.

At a General Meeting held on Thursday, May 7th, 1857, Mr W. Bragg in the Chair, the Censors, Messrs J. Holland, J. Robinson, E. Sanderson, J. Wiggins, and J. Edwards, furnished a report of the following awards to seedlings:—

First class certificate to Cineraria, Perfection—Habit excellent and robust, truss large and regular, form first-rate, size medium, substance and texture superlative, colour white ground, with broad rich deep rosy carmine tips, disc greyish brown, and well proportioned—as a whole, this variety is of the highest merit; from Mr C. Turner, Slough.

Certificates of merit to the following:—Cineraria, Guiglini—Habit moderate, truss somewhat irregular and open, form average, size medium, substance good, colour deep lake-purple broad tips, on white ground, disc exceedingly well proportioned, and in colour almost black. The best features of this variety are its attractiveness and dissimilarity; from Mr C. Turner, Slough. Scarlet Pelargonium, Blazer—Habit very first-rate, truss full size,

form about average, colour bright scarlet, foliage neat and with short foot stalks, flower stalks erect and of deep crimson colour—a first-rate bedding variety, and peculiarly short jointed; from Mr Bragg, Slough. *Pelargonium*, *Bride*—Habit most admirable, truss full, average 5-6 pips, colour pure white, with feathery spot of rosy carmine on upper petals; from E. Beck, Esq., Isleworth. *Pelargonium*, *Vestal*—Habit good and robust, truss full, average 5-6 pips, colour pure white, with deep crimson somewhat feathery spot on upper petals; from E. Beck, Esq., Isleworth.

Additional Memoranda.

CINERARIA.

Mr Turner of Slough sent:—*Diadem*—White, with rich rosy tips.

PELARGONIUMS.

Mr E. Beck, Esq., of Isleworth, exhibited the following:—*Bellona*—A free blooming somewhat novel looking sort, not over attractive, upper petals crimson, lower petals crimson veined on a deep pink. *Salmonia*—Flowers small, lower petals of a salmon rose tint. *Lycidas*—Upper petals dark, lower petals deep pink, slightly mottled with crimson. *Unconquerable*—A small flower, of the much wished-for scarlet show class.

MISCELLANEOUS.

Mr Bragg again produced a collection of neat *Pansy* blooms, the best of which were Admiral Dundas, Rifleman, Jeannie, Satisfaction, Yellow Model, Cyrus, Memnon, and Yellow Climax.

E. Beck, Esq., staged a box of *Cut Pelargonium* flowers, mostly unnamed seedlings, and for the most part of great worth.

Cut blooms of *Azaleas* were exhibited by Messrs Ivory & Son, Dorking, including *Rosy Circle*, *Gem*, *Stanleyana*, *Symmetry*, *Crispiflora*, *Criterion*, *Iveryana*, *Juliana*, the true deep yellow *Sinensis*, and six seedlings of merit; one, a large double white, is likely to prove desirable.

At a general meeting held on Thursday, June 11th, 1857, the Rev. J. Dix in the Chair, the Censors, Messrs Robinson, Lidgard, Parsons, and the Rev. J. Dix, furnished a report of the following awards to Seedlings:—

First Class Certificates to the following:—*Pelargonium*, the *Bride*—Habit good, truss free, five to six pips, pure white, upper petals with feathery spot of rosy carmine lilac. This flower had improved since the previous exhibition; from E. Beck, Esq. Isleworth. *Fancy Pelargonium*, *Acmé*—Habit first-rate, free blooming, truss six pips, form unequalled, size medium, substance stout, colour rich mulberry, with white throat and uniform margin, an improved *Evening Star*. *Fancy Pelargonium*, *Mrs Turner*—Colour bright rose, the characteristics of this flower are precisely those of the preceding, it is an improved high coloured *Celestial*; from Mr Turner, Slough. *Pelargonium*, *Minnie*—Habit good, truss three and four pips, form and substance good, size medium, colour rich bright carmine, upper petals black, margin beautifully defined with rich crimson, a flower of much refinement; from E. Foster, Esq., Clewer. *Variegated Pelargonium*, *Perfection* (*Lennox*)—Habit free, and well adapted for bedding purposes, truss average, size medium, form good, colour bright orange scarlet, with light eye, foliage finely variegated, broad white margin, free from cupping, both foliage and flowers of great merit; from Mr C. Turner, Slough.

Certificates of Merit to the following:—*Pelargonium*, *Rosy Gem*—Habit good, truss four pips, size and substance good, form medium, colour rich rose, very attractive. *Pelargonium*, *Etna*—Habit good, truss five pips, size and substance average, form medium, colour orange-scarlet sparingly mottled, upper petals dark. As a high coloured variety, this is both free and vigorous. *Pelargonium*, *Imperatrice*—Habit good, truss four to five pips, size large, substance stout, form average, colour pinkish rose, slightly mottled crimson, throat bold, pure white, upper petals bold, dark and slightly margined; from Mr Turner. *Pansy*, *Mrs Hope* (*Fraser*)—Outline circular,

substance stout, size medium, colour rich yellow ground, with broad well defined and regular margin of purplish maroon, texture good, edges smooth, colours rich, flowers rather immature, and wanting further expansion; from Messrs Downie & Laird, Edinburgh.

Label of Commendation to *Heliotropium, Compactum*—Habit dwarf and compact, colour pale lilac, nearly white; from Mr J. Cole, St Albans.

MEMORANDA.

The stand of Pansies (24) from Messrs Downie & Laird, of Edinburgh, and exhibited on the previous day before the Scottish Pansy Society, were, as a whole, so good, that their names are appended for the information of those growers who might not otherwise obtain such information:—*Duchess of Wellington*, *Una*, *Flower of the Day*, *Princess*, *Jeannie*, *Nonpareil*, *Alliance*, *Lord Cardigan*, *Sir Colin Campbell*, *Lord Palmerston*, *Royal Standard*, *Mr R. Masson*, *Cyrus*, *Countess of Roslyn*, *Sir J. Cathcart*, *Colonel Wyndham*, *William*, *Saint Andrew*, *Beauty*, *Matchless*, *Yellow Model*, *Miss Talbot*, *Duke of Sutherland*, and *Lady Matheson*.

PANSIES.

Messrs Downie & Laird, of Edinburgh, exhibited:—*Mrs Hope* (Fraser)—Dark maroon-purple, with clear bright yellow centre, and well defined dark eye.

Mr R. M. Stark, Edinburgh, exhibited:—*Empress Eugenie* (Hampden)—Yellow and bronze, needing smoothness and substance.

PELARGONIUMS.

Mr Turner of Slough exhibited:—*Rose Celestial*—A noble looking flower, arresting the eye like the last; the lower petals remarkably broad and fine, clear rose, the white centre very conspicuous; the upper petals dark maroon, passing to deep rose, with a pink margin, are sportive in colour, or this would have been a first-class variety. A grand flower for ornamental purposes.

G. W. Hoyle, Esq., of Reading, exhibited:—*Richard Benyon*—Large, free, and brilliant; upper petals dark maroon, breaking to crimson towards the narrow margin of pure carmine, somewhat uneven; lower petals, bold rich carmine.

Major Focquet exhibited:—*Evangeline*—The upper petals dark maroon, with narrow rose-purple border; lower petals too long, veiny rose-purple; white centre.

From E. Foster, Esq., of Clewer, came:—*Blink Bonnie*—Attractive, and of good quality; upper petals maroon, passing off to crimson, with a pink edge; lower, pink; the centre white. *Claudia*—Upper petals maroon, passing to rose-crimson, with pink edge; lower, pink; the centre white. *Sprightliness*—Upper petals maroon, passing to crimson, with pink edge; lower, blotchy pink; the centre white. *Faunus*—Upper petals dark maroon, scarcely bordered with red; lower, rich carmine, veiny and blotched; the centre strongly blue tinted.

From E. Beck, Esq., of Isleworth, came:—*Mars*—A rich flower, but weakly in habit; upper petals dark maroon, with narrow even margin of carmine; lower, bright carmine, veiny and somewhat blotched; the centre bluish. *Annie*—A useful white flower for decoration; upper petals white, with largish blotch of maroon, breaking off into purple veins; lower, pure white.

FANCY PELARGONIUMS.

The following were shown by Mr Turner, of Slough:—*Crimson Pet*—A very dwarf and dense flowered variety, similar in colour to *Mrs Turner*, but dwarfer, and with a more decided white border. *Princess Royal*—A large flowered kind, delicately tinted, somewhat frilled; upper petals with a zone-like blotch of blush, scarcely a faint rose; lower, whitish; a free bloomer, and compact in habit. *Adela*—This has a broken zone-like marking of blush on all the petals occupying most of the surface; the edge pale; the centre

white. *Warrior*—Large; upper petals bright purplish rose, with narrow white edge; the lower blotched and veiny; the centre white—shown last year. *Claudiana*—Upper petals maroon-tinted rose-purple, scarcely margined; lower, heavily marked with rosy-purple; the centre white. *Gipsy Bride*—Upper petals maroon purple, edged with white; lower, with broken zone-like marking of purple.

SPOTTED PELARGONIUMS.

The following came from Mr Turner, of Slough:—*Mazeppa*—Large, showy, and of good quality; upper petals dark maroon, with narrow edge of rose; lower, rose with dense maroon blotch. *Mr Marnock*—Upper petals maroon, passing off to crimson, with deep rose-pink margin; lower, deep rose-pink, with dense maroon spot. *Cherry Ripe*—Upper petals blush, with moderate sized blotch of maroon, passing into crimson; lower, blush, with small bright crimson spot; the centre white. *Spotted Beauty*—A dwarf free flowering but common looking variety; blush ground, with dense blotches of maroon, passing off to crimson.

From E. Beck, Esq., of Isleworth, came:—*Fancy*—A lively flower; upper petals maroon, passing to crimson, with white edge; lower, dark crimson, blotchy and veiny.

SCARLET PELARGONIUM.

The following was exhibited by Mr Cole, of St Albans:—*Conqueror*—A large flowered brilliant scarlet, but coarse.

TEA-SCENTED ROSE.

Mr G. Smith, of Hornsey, sent:—*Combatant*—A very fragrant flower, of a deep blush colour.

MISCELLANEOUS.

Rhododendron Jenkinsii, one of the new Bhotan species, was produced by Messrs Cutbush & Son, of Highgate, for the first time, we believe, in public. It has lanceolate pointed opaque leaves, and heads of about four flowers, large funnel-shaped, with an expanded limb, blush white, the bud strongly tinged with red exteriorly.

At a General Meeting held on Thursday, June 25th, 1857, the Rev. J. Dix in the Chair, the Censors, Messrs Dix, Parsons, G. Smith, and W. Dean, furnished a report of the following awards to seedlings:—

First class certificates to the following.—Pink, Miss Eaton—Form and substance good, size medium, petal large and smooth, colour heavy purple, bright and rich, marking very regular; from Dr Maclean. Achimenes, Meteor—Habit good, size and form medium, stout, colour bright carmine, with shaded purple centre and spotted orange throat; from Mr A. Parsons, Welwyn.

Certificates of Merit to the following:—Pelargonium, Richard Benyon—Truss 4-5 pips, form and substance good, size medium, colour rosy scarlet, with dark blotch on upper petals; from G. W. Hoyle, Esq., Reading. Spotted Pelargonium, Mazeppa—Habit good and very free, truss five pips, form medium, substance good, size large, colour rose, with well defined spot on under petals, upper petals dark, edged rose. Spotted Pelargonium, Queen of Beauties—Habit good and very free, truss 5-6 pips, form, size, and substance good average, colour blush white, with distinct carmine spot. Fancy Pelargonium, Alice—Habit good, with strength, truss 5-6 pips, form, size, and substance commendable, colour rosy purple, with conspicuous white eye, but somewhat wanting in refinement of colour. Fancy Pelargonium, Queen of Lilacs—Habit moderate, not over free, form, size, and substance good, colour delicate rosy lilac with white centre, chaste and pleasing; from Mr C. Turner, Slough. Verbena, Carlos—Habit good, truss full size, and well closed to the centre, form medium, stout, colour blush white, with pale carmine ring round the eye; from Mr G. Smith, Hornsey Road. Pink Eugenie—Outline good, size and substance medium, colour

light purple; from Dr Maclean, Colchester. *Pink, Crystal Palace*—Size full, stout, colour light purple, well marked; from Mr Bragg, Slough.

MEMORANDA.

SHRUBBY CALCEOLARIA.

Mr G. Smith, Tollington Nursery, Hornsey Road, exhibited:—*Pet*—Scarcely so good as *Rubra*, which it much resembles in colour.

PINKS.

Dr Maclean, of Colchester, forwarded:—*The Pride of Colchester*—Heavy purple edge. *Napoleon*—Heavy edged purple, with much to recommend.

Mr Bragg, of Slough, sent:—*Norah*—Too thin and serrated for the present day. *Blink Bonnie*—No improvement on sorts in cultivation. *Crystal Palace*—Light purple, regularly displayed on each petal, the edges not over smooth.

PELARGONIUMS.

Mr Hocken, Truro, contributed:—*Charlotte*—Free to bloom, rather below average size, colour satin white under petals, dark blotch not well defined in upper petals.

Mr Turner, Slough, produced:—*Duke of Cambridge*—Rather distinct, salmon rose with dark top petals.

FANCY PELARGONIUMS.

From Mr Turner, Slough, came:—*Clara Novello*—Rosy carmine with white centre and broad white margin, free and desirable. *Decision*—A greatly improved *Hero of Surrey*. *Rosabella*—A light kind in the way of *Jenny Lind*, *Perfection*, &c., of improved form and very free.

VARIEGATED PELARGONIUM.

Mr C. Turner, exhibited:—*Julia*—Habit and foliage of *Flower of the Day*; flowers scarlet, produced in large trusses.

PHLOX.

Mr Cunningham, Fulham, sent:—*Oculata rosea*—If of good habit this will be valuable for bedding; bright rose with white eye; cut blooms only.

VERBENA.

Mr Wyness, Buckingham Palace Gardens, contributed:—*Lord Alfred Paget*—Rosy purple with dark centre.

MISCELLANEOUS.

Petunia, Exquisite—White with purple throat; of fine form and dwarf free habit; a variety sent out by Mr Walters, of Helperton—the best of the white kinds; produced by Mr G. Smith, Hornsey Road.

At a General Meeting held on Thursday, July 2d, 1857, Mr James Cutbush in the Chair, the Censors, Messrs Keynes, Robinson, Cutbush, and Edwards furnished a report of the following awards to seedlings:—

First class certificate to Scarlet Pelargonium, *Rosa Bonheur*—Habit stout and compact, truss large and full, colour bright cerise scarlet with white eye, foliage bold, handsome, and slightly horse-shoe marked; from Mr Bragg.

DOUBLE PETUNIAS.

From Mr Grieve, of Bury St Edmunds, and Mr Watson, of Barnet, were exhibited—Several varieties of these novel flowers, all highly fragrant, their colours varying from white to deep rose, and passing thence into purple. They afforded unmistakeable evidence of the attention which a meritorious novelty like the parent, *Imperial*, from which they have sprung, is certain to secure at the hands of the florist. These varieties, besides affording many new shades of colour, are also decided improvements on *Imperial*, being larger, stouter, and fully as fragrant.

The Censors having expressed their approbation of the efforts by which these improvements have been attained, and highly commended the varieties

now submitted to them as evidence of progress, it is suggested that a careful selection of the most distinct and meritorious kinds should now be made, both in order that their merits individually, may be tested, and also in aid of further advances.

CHRYSANTHEMUMS.

The Stoke Newington Society will hold its Eleventh Annual Exhibition on the 17th and 18th instant. Those of our readers who may be in London at that time will be amply repaid by an inspection of the flowers and plants of this extraordinary winter flowering subject.

There is in the arrangement of the schedule so much to commend, that we hesitate not to render it in full—the system by which the funds is apportioned being beyond all praise for liberality and equity.

Class 1. Six plants, size of pot not to exceed No. 12, Chiswick standard, i.e., 11½ inches in breadth and 10 inches in depth, 1 inch below the rim; distinct varieties: one plant in each pot.

Class 2. Single specimens, open to all exhibitors; size of pot as in class 1.

Class 3. Six plants of Pompones; distinct varieties; one plant in each pot; size of pot not to exceed 8 inches, Chiswick standard.

Plants (single stems only), exhibited in pots other than those in which they are grown will be disqualified.

Class 4. Twenty-four cut blooms; distinct varieties.

Class 5. Twelve cut blooms; distinct varieties.

Class 6. Six cut blooms; distinct varieties.

Class 7. Six cut blooms; distinct Anemone flowered varieties.

Class 8. Six cut blooms; distinct varieties, Anemone Pompones.

Class 9. Six cut blooms; distinct varieties, *to be competed for by Members who have never taken a prize for cut blooms of Chrysanthemums. Competitors in this Class are not at liberty to exhibit in any other.*

The difference between the prizes in each class shall be two shillings and sixpence. The first prize in

Classes 1 and 4 shall be 2s 6d more than the first prize in classes 3 and 5.

Classes 3 and 5 shall be 2s 6d more than the first prize in 6 and 7.

Classes 6 and 7 shall be 2s 6d more than the first prize in class 9.

Class 9 shall be 2s 6d more than the first prize in class 2.

Class 2 shall be 2s 6d more than the first prize in class 8.

Prizes are to be awarded to two-thirds the number of exhibitors in each class; the judges having a discretionary power to award extra prizes to any collection of plants or flowers deemed worthy thereof.

SEED SAVING.—So favourable has the past season been for saving seeds in the south, that we shall not be surprised if of special subjects—such as Hollyhocks Dahlias, Pinks, &c.—there should be a general abundance. Indeed, we know this to be the fact already; and cannot but conceive that the progeny which will spring therefrom must offer all that soul-stirring progress so much cherished by the florist.

BANKSIAN ROSE.—Any of your subscribers who wish to see the Banksian (white and yellow) Rose in the highest state of perfection, would do so on visiting the gardens of Colonel Tottenham, at Woodstock, near Newton-Mount-Kennedy, county Wicklow. It is in full bloom in May and June—a very old tree (perhaps 35 or 40 years old), and always pruned soon after it has done flowering. I once found a question as to its culture in one of your Numbers.—A. D. TOTTENHAM.

GOOSEBERRY CATERPILLAR.—I have much pleasure in bearing testimony to what Mr Fowler says in the last Number of the *Scottish Gardener* on this subject. I have done exactly what he there recommends, every winter for years, with great success; and as prevention is always better than cure, it would be well that every cottager would adopt it.—WILLIAM GAVIN, Hoptoun Gardens.

SALVIA GESNERIFLORA.—I have been reading over again Mr Errington's remarks upon winter-flowering plants in the September Number, page 398. When speaking of "the two best Salvias," it is stated that *Salvia gesneriflora* is "blue." Is this the real colour of that variety of *Salvia*? or is it a slip of the pen or press? If *Gesneriflora* be "blue," then what I have been growing for that variety is not it, but something which has been sold to me under that name. I do not write this for the sake of finding fault, but for information on the subject; because anything from the experienced pen of Mr Errington has very great weight, especially with me, as I happen to know him personally.—T. J., Manchester.

MILDEW IN PEAS.—I observe in your last Number of the *Scottish Gardener* a few remarks on this subject by Mr Robson, copied from the *Cottage Gardener*. It is not my intention to discuss the cause of mildew, as I agree with Mr Robson's opinions. I have, however, observed, that as a rule, crops of late Peas can be more readily obtained in the midland districts and the north, than in the hot and sunny south. I believe this is in consequence of greater humidity in the air during the summer and early autumn months, as well as a greater amount of moisture in the earth during the same period. During the early part of this month I was in the neighbourhood of Bradford, in Yorkshire, and to my surprise, and, I need not say, pleasure, often had a delicious dish of Peas placed before me; and on enquiring the name of the variety, I found it was Fairbeard's Nonpareil, a variety I had sent to some friends there nearly three years since. This Pea is found to resist mildew better than any other, and a great many varieties have been tried in the same garden. It is a wrinkled white marrow Pea, growing four feet high, and produces a heavy crop of well-filled pods; and no trace of mildew was to be found upon this variety when I saw it growing in September and early in October. It was growing freely in one garden, where the soil is shallow, and resting on rock, and was sustained by the moist soil and climate of the northern district. In such a soil in the south, success would have been impossible.—WILLIAM DEAN.

CALENDAR OF OPERATIONS FOR NOVEMBER.

VEGETABLES.

Finish the earthing-up of Celery and Cardoons. If not already done, get Beet and Carrots into the root house. See that the required supplies of brown coss Lettuce and Endive are placed in frames for winter salads. Clear the decaying leaves from Seakale, and place the pots over the crowns of those plants that are to be forced for Christmas supply, where the more convenient plan of forcing it in the Mushroom house is not available. Place a spare frame over a good patch of Parsley, and during severe frost or snow cover it with either glass or some other material, and only have recourse to it in severe weather, when other sources are frozen up. Clear all rubbish from Asparagus beds, and get the whole garden made neat and orderly, wheeling all rubbish on to those quarters that are to be trenched during the winter. As soon as the leaves drop, get Currant and Gooseberry trees pruned, and the breaks dug; in fact, get all done this month that can be judiciously done, for the next may lock the soil in its icy grasp.

FORCING DEPARTMENT.

PINES.—The season has now arrived when great care and moderation is necessary in the application of heat and moisture to Pines. In the case of those plants that are intended to start early in the year, it is much safer to regulate the temperature rather low than otherwise for the next six or eight weeks. A night temperature of from 55° to 60° is sufficiently high. But

while urging a rather low temperature, in order to secure that state of rest during the dull season which is necessary to a successful start, it may be necessary to warn against an extreme in the way of withholding water at the root, which, especially in times gone by, was practised to an injurious extent. If the fruiting stock are as they ought to be, their pots will be full of roots; and on the maintenance of these in health and freshness, depends a strong and satisfactory show of fruit. Guard, therefore, as much against allowing the soil to become "mealy" dry as against anything like an excess of moisture. Whenever water is applied, let it always be of the same temperature as that of the plunging material, which for the present should not range higher than from 78° to 80° . If possible, keep all fruit that are swelling off in a compartment by themselves, so that a greater degree of moisture and a higher temperature can be afforded them than is good for the general stock at this season. These should have a temperature of 65° at night, with a bottom heat of 80° or a few degrees more. Water them occasionally with liquid manure, and syringe them in fine days about the axils of the leaves. Succession stock that were shifted somewhat late, should be kept gently on the move. Be sure that they are near the glass, and the glass kept clean, in order to admit as much light as possible to keep them from drawing. Coverings of some description should now be used; it will economise fuel, and will maintain a more genial atmosphere than a greater degree of fire heat. Give air to all these structures on every favourable opportunity, and maintain thorough cleanliness, bearing in mind that a "sweet" atmosphere is of no small importance to vegetable as well as animal life.

VINES.—Look carefully and often over Grapes intended to hang through the winter, and remove every berry as soon as the least signs of decay are observed. Maintain a dry atmosphere by the application of fire heat, especially on fine days when air can be freely given to carry off the damp. Be careful not to have much artificial heat at night when the house is shut; the result of which is moisture in suspension, which gets condensed by and settled on the Grapes. Presuming that the early vinery was pruned and otherwise prepared for starting by the end of last month, a quantity of leaves should now be got into the body of the house as soon as possible, or where tan is cheap and easily procured, it will answer the same end. This fermenting material should be turned over in portions every day in order to raise a steam, which is by far the surest way of getting Vines to break regularly at this season of the year. Where this plan can be adopted, little or no fire heat will be necessary for the first few weeks, as the body of warm material will keep the temperature sufficiently high. The Vines should be hung down so as to bring the tops of the Vines into the same temperature as the lower parts of them. Syringe the rods freely with tepid water several times a-day, and give more or less air daily as weather may permit. Where the borders are outside, and heat is supplied to them by means of fermenting materials, such as dung and leaves, see that the heat is steadily maintained, otherwise it had better never be applied at all. Pot-Vines that may have been started last month and that show signs of motion may have a slight increase of temperature, ranging at about 55° at night, and making the most of every "blink" of sun. Keep the atmosphere moist, and admit a little air daily. Let succession houses be pruned and dressed as directed in previous Calendars directly they have completely shed their leaves, and see that every border connected with early Vines be protected from drenching rains—in fact from all wet. If not done last month, examine the outlet drains from all borders, and see that they are clear and acting as they ought.

PEACH HOUSE.—Presuming that in accordance with last month's directions the early house has been got in readiness for a start, the house may be shut up by the middle of the month, and gentle fires applied towards its close. But be careful that commencing thus early they are not excited too hastily; and in fact, unless the wood is thoroughly ripened, and the trees in the best of health, it will be best to wait for another month. Strip the leaves from late trees where any are still hanging, and get succession houses pruned and otherwise put in order.

STRAWBERRIES IN POTS.—These should no longer be exposed to the mercy of the weather. Cold frames or late Peach houses or Vineries may be made use of for sheltering these; or, where none of these are available, build them into stacks, laying the pots on their sides one above the other, filling up the space between with ashes or sawdust. In this way they can be readily protected, when necessary, with mats or straw.

CUCUMBERS.—We have now dark days and long damp nights, which is trying to Cucumbers. The temperature should now be kept rather low than otherwise; about 60° at night will be sufficiently high, and of course moisture must be more sparingly administered. Continue to keep the growths stopped, and never allow anything like a crowded foliage. Admit air on every fine day, and endeavour to get the foliage dry once in the day if possible.

ORCHARD HOUSE.—Little can be said of this department at present. Keep the trees rather dry at the root, and give abundance of air. Now is a good time to pot the various sorts of fruit trees that may be required for forcing. In potting, use a sharp unctuous loam, with about a third of well rotted dung, and pot as firmly as possible.

FLORISTS' FLOWERS.*

DAHLIAS.—The roots should now be stored away in a dry place for the winter, where they will be secure from frost. See that the names are properly attached to the roots with copper wire, or something similar that is not liable to rot. If a little earth is left about the roots, in a dry state, so much the better.

PANSIES IN BEDS.—Any that are likely to be injured by wind should either be secured to stakes or pegged down. To protect the plants from frost, nothing answers the purpose better than a bast mat laid flat on the beds, having a few stakes stuck here and there in the beds, standing about three inches above the ground; these keep the mat from resting on the plants; peg it down at the sides, so that the wind may not blow it off; keep the beds free from weeds and leaves that may be blown in among them.

PANSIES IN POTS UNDER GLASS.—Give all the air possible in fine weather by removing the lights; only protect from drenching rains, frost, &c. Keep the plants clean by removing all decayed foliage and otherwise; they will be little trouble for the next three months.

HOLLYHOCKS.—If not previously done, lift the old roots of all new and scarce varieties, have them potted and plunged in a cold frame in coal ashes, or placed in a house where they can have plenty of air in fine weather; be careful not to over-water, more especially in damp dull weather; re-pot any of the young plants that require more pot room, and give air night and day if the weather is favourable. Cuttings may still be put in, but every attention must be paid to guard against damp, as it is very destructive at this season; late struck plants should be wintered in a house where they can have the advantage of a little fire heat during frost, or in continued damp weather; remove all decayed foliage, water seedlings carefully, and give plenty of air, so that they may be hardened to stand the winter.

CINERARIAS.—Should any of the late struck plants require more pot room, lose no time in having them shifted into larger pots; use fibrous loam, leaf-mould, old cow dung, and a little sand; where large specimens are wanted, see that the plants have plenty of growing and pot room, and kept as near to the glass as possible, as the dwarfier they can be bloomed the better; remove all decayed foliage; should there be appearance of mildew, dust with sulphur; fumigate occasionally to keep down greenfly; give plenty of air in fine weather; water sparingly, but make sure that none suffer from the want of it. Shift on seedlings, &c.

CALCEOLARIAS.—When a large stock is wanted, cuttings may still be put in with every probability of success; remove all dead foliage from the old plants; water sparingly; give as much air as possible in fine weather, but be careful not to expose the plants to cold cutting winds; fumigate occasionally to destroy greenfly. Pot off seedlings, &c.

PELARGONIUMS.—All the plants that require more pot room should be at-

* By Mr J. Downie, of Downie & Laird.

tended to immediately; shift into pots a size larger, and be careful not to over-water at this season; make sure that they want water before giving it; keep the house dry; a little fire will be found beneficial in cold damp weather; give air at the same time, to give motion to the atmosphere. Pay every attention to the training of the plants, and be careful not to overcrowd them. Stir the surface of the soil of any that may be getting too close; remove decayed foliage, and keep down greenfly by occasional fumigation. Keep the fancy varieties at the warm end of the house, and a little drier than the large flowering sorts; give air on all occasions when the weather is favourable, but avoid cold draughts by the side sashes.

AURICULAS.*—Continue to keep the plants free from decaying leaves. Give plenty of air during all mild weather, but during frost, close the sashes and ventilators. Keep the plants dry, as they will now be dormant. Whenever the leaves of a plant offer to thrive give it a little water, but so long as the leaves remain plump the plants require none.

POLYANTHUS.—As these plants are more liable to be injured by severe frosts than the Auricula, it will be safe practice to plunge the pots into some dry ashes or sawdust. During frost, cover them with a mat. Give very little water during the whole of the winter months, and then only when the plants incline to become flaccid. During all mild weather give plenty of air. Keep them clean.

PINKS will require little attention now; those in the open ground will require to be protected from being broken over by wind; stick a few pegs about the plants that are much exposed—this will save them. Those in pots will require to be kept free from decaying leaves. Give them plenty of air, and a little water occasionally.

TULIPS.—Whenever the soil is in a sufficiently dry state plant the beds; let the distance between the rows be either six or seven inches, and seven bulbs in the row of a bed 4 feet wide; envelope the bulbs in clean sharp river sand. See that the sand used is free from all oxides. Have the bed raised in the middle to throw off heavy rains. Cover the bulbs in the outside rows with at least three inches of soil, and the tall riders in the middle row with an inch more. Rake the surface of the beds nicely.

CARNATIONS AND PICOTEES.—These plants will now be well established in their store pots. Give every attention to cleanliness, and to the keeping of the foliage dry. Give as much air as possible night and day, during all favourable weather, and a moderate supply of water during the absence of frost. Make up some compost for growing the plants in next season. Maiden loam, *alias* rotten turves, from an old pasture, is the only soil that should be used, mixed with its own bulk of rotten dung, that has been used for a hot bed. Dung that has not been used for this purpose, less will do—say one-third. Mix it with some leaf mould, and lay it in a round heap. This should have been done last month, but I omitted to mention it.

RANUNCULUS.—Keep the beds free from weeds during the winter, and look over the roots occasionally, and see that they do not contract mould.

CHRYSANTHUMS.†—For large blooms continue to rub off all laterals as they appear. Give air in abundance. Sulphur the first spot of mildew. Watch for earwigs. If blooms are wanted on a given day, and if coming too fast, set the plants out of doors during the day, taking them into the house at night; or if too early, generally shade the house.

SPECIMENS AND POMPONES.—Give plenty of liquid manure, remove all decaying foliage, and tie in any straggling shoots.

AZALEAS.—Be careful not to over-water, and be as careful not to allow to become dry; "the happy medium" is the rule. This is the season of rest, more particularly with early plants, consequently require little water. Keep clear of decaying foliage, and air freely on fine days.

EPACRIS.—The early sorts will now be coming into bloom. Remove them to decorate the conservatory, and set the next succession plants into where they were removed from—that is the warmest end of the greenhouse. Keep the happy medium in watering these also.

* By Mr G. Lightbody, Falkirk. † By Mr Laing, Dysart Gardens.

THE SCOTTISH GARDENER.

GEOGRAPHICAL DISTRIBUTION OF PLANTS.—No. 3.

IN our last paper we adverted to the two physical conditions of Station and Climate, as the main influences which affect the distribution and the growth of plants; but there are other facts which can hardly be reduced to any natural law, and which must therefore appear in the light of peculiarities. Of these we shall endeavour to make such a selection as may be interesting to the general reader. Meanwhile, we beg to say that we are not writing a formal treatise on the subject, but are only giving a few sketches, which we hope may direct the attention of youthful gardeners and amateurs to geographical botany, and may awaken such curiosity as will lead them to books that treat professedly of the subject. In addition to the works recommended in our first paper, we may mention Sir William Hooker's contributions to the geography of plants in Murray's *Encyclopædia of Geography*—a series of papers, illustrated with neat wood engravings, which, though published more than 20 years ago, are, perhaps, not yet excelled in interest by any recent publications. We at times glance over them still, with something like a renewal of the pleasure with which we perused them on their first appearance.

1. Some plants can scarcely be said to be distributed at all, except as cultivated by man. There is a species of Silver Fir, *Pinus Cephalonica* of Endlicher, which is to be found in a state of nature only on the Black Mountain of Cephalonia, one of the Ionian Islands, where it was discovered, about 1824, by General Sir C. Napier, the conqueror of Scinde. It is now pretty extensively diffused in our Pinetums. "The Tree-pink (*Dianthus arboreus*) grows still on the single rock in the Island of Crete, where Prosper Alpinus first detected it; and the *Double Cocoa Nut* of the isle Praslin,

one of the little group of islands called the Seychelles, notwithstanding the annual floating of its nuts for many thousands of miles, has never established itself in any other place.”—(*Hooker.*) “The smallest areas” (in the diffusion of plants), says the younger De Candolle, “are generally found in islands, and particularly in those which are of small extent, and at great distances from other lands. The island of St Helena, for example, presents several species not only peculiar to its Flora, but which are found only at one single point, in a very rugged ravine. The goats unfortunately make their way thither, and are destroying the remains of a vegetation that, perhaps, has survived many geological epochs, during which that of other countries was submerged—the remains of a vegetation which probably is the only relic of the Flora of a great continent, or archipelago, destroyed by the sea.” He adds in a note—“One of the beautiful species of Ferns, *Dicksonia arborescens*, according to Dr Hooker, is found only on the summit of the peak of Diana. It has been introduced into the English gardens; and we shall, perhaps, see those species of St Helena disappear in their natal soil, and be preserved in cultivation.”—*Geographie Botanique*, p. 586.

Nor is this limitation confined merely to islands. The same author states a variety of curious facts relative to continental vegetation, of which the following is a selection:—*Campanula excisa* has been gathered only in a small district of the Valaisan Alps between La Furca and Mont Rosa. The beautiful *Campanula isophylla* grows wild only on the promontory of *Capri Zoppa*, on the coast of Genoa. The annual *Omphalodes littoralis* is confined to a small extent of the west coast of France, between Rochelle and Quiberon. So the annuals *Linaria Candollei* and *L. arenaria* are peculiar to the shores of Brittany. Several species of *Erica* have been obtained exclusively in certain fissures of the Table Mountain, at the Cape of Good Hope, though other mountainous regions of that quarter have been often visited. It is to be remembered, however, that these statements are to be received with some reservation; for further botanical research may reveal a more extensive diffusion of some of the plants in question. In Mexico, an aged tree of *Cheirostemon platanoideus*, or Hand Plant, was long believed to be the only individual in the world, and as such was regarded with religious veneration; nevertheless, Humboldt and Bonpland discovered immense forests of it in the province of Guatemala, in New Spain. Still it is not impossible that monadic, or solitary, plants of some species may exist, like the Dodo bird, the last of their race.

2. There are peculiarities of distribution relatively to latitude and longitude, which are not only curious in themselves, but have a special theoretical interest. Of these we shall mention a few.

Some plants, with a considerable range in latitude—that is, as occurring south and north—are confined within very restricted limits in longitude; in other words, in narrow areas measured east and west. In our own country some plants are said to be found only on the west

side of the island, such as *Pinguicula Lusitanica*, *Sison* (*Carum*) *verticillatum*, *Brassica Monensis*. That this limitation does not arise solely from climate, is shown by the fact, that these species are easily cultivated on the eastern side of the island. Others such as *Cenanthe Pimpenelloides* and *Hypericum Androsæum* are found chiefly, though not exclusively on the west. Ireland, too, has *Arbutus unedo*, *Daboecia polifolia*, *Erica mediterranea*, which re-appear in the west of France, or in Asturias in the west of Spain. It is probable that future investigations will ascertain that the opposite sides of continents have respectively many plants peculiar to themselves. "On the western side of the Cordilleras of Chili, *Calceolarias* grow, which are not found on the Eastern side. *Lobelia Dortmanna* seems to be confined to the western European countries. *Tamus communis*, *Briza minor*, *Gastridium lendigerum* and *Calamintha officinalis* are said to have a tendency to migrate in a north-westerly direction towards their vanishing point."—(*Dr Balfour*.) There are two plants—*Potentilla tridentata*, peculiar in Europe to Scotland, and *Eriocaulon septangulare*, found sparingly on the west of Scotland and Ireland, which have to look for their congeners to the continent of America; speaking perhaps of a time when the broad Atlantic with its circling currents was not. And here we may note, though the disruption involved is in a transverse direction, that Sicily, Malta, and the south of Spain have certain similar alliances with the opposite African coast. In the latter case, the instances, we believe, are more numerous, in proportion as the distances are less.

The range in longitude—that is, along the same parallels of latitude—of many plants is often very great, as indeed might have been expected, from the sameness of climate, and the similarity of soils which vegetable matter decaying under analogous conditions is calculated to produce. The common Marsh Marygold, *Caltha palustris*, is found throughout Europe, in Northern Asia, as far south as the Caucasus, and east as Kamtschatka, and in America in the Oregon and Canada; in short, along the whole northern edge of the northern temperate zone. It would be easy to give numerous other examples, were it not to load our pages unnecessarily with lists of names. The reader may be referred to *De Candolle, Geog. Botanique*, p. 564.

The range in latitude—that is, along the great circles of longitude—though not due exactly to the same causes, is not unfrequently prodigious. *Drimys Winteri*, which affords Winter's bark, one of the Magnoliaceæ, we are informed by Dr Balfour, "extends over no less than 86° of latitude, or 5160 geographical miles, forming, at the southern limit of its growth, one of the trees which advance nearest to the antarctic circle, and reaching as high a latitude as any flowering plant, save the solitary Grass of the South Shetland Islands. Such an extraordinarily extended range," it is added, quoting from Hooker's *Antarctic Flora*, "is in part obviously due to some

peculiarities in the form and surface of South America, where under every degree of latitude there are large areas, either at the level of the sea, or at an elevation, where such a tree can enjoy a climate that is equable."—(*Class Book of Botany*, p. 984.)

3. We mentioned in our opening paper that certain plants, such as common Chickweed, Dandelion, Groundsel, Shepherd's Purse, &c., seem to attend the footsteps of man throughout the world. Wherever there is human culture of fields or gardens, there they are sure to appear. De Candolle gives an interesting list of species, not much, or not at all, dependant on cultivation, which yet occupy, or are to be found throughout, at least, a third of the terrestrial surface of the globe. The following may be given as examples :—*Thymus Serpyllum* ; extending over the whole of Europe, the north of Asia, as far as Mount Taurus and Dahuria ; on the Himalayas, Abyssinia, North Africa, Madeira, North America to Greenland, and in the eastern United States, as Pennsylvania and New England.

Veronica serpyllifolia, in the northern hemisphere, from the Arctic Regions to Madeira, Algiers, Caucasus, and the Himalayas ; in the United States, mountains of Jamaica, chain of the Andes as far as Quito and Quindiu ; the Melville Islands, and the Cape of Good Hope.

We add a few of the most interesting names out of this list, promising that it comprises in all 116 species :—

Ranunculus aquatilis.

————— *repens*.

Argemone Mexicana.

Drosera rotundifolia.

Oxalis corniculata.

Trifolium repens.

Callitriche verna.

Daucus Carota.

Artemisia vulgaris.

Anagallis arvensis.

Menyanthes trifoliata.

Rumex acetosella,

Alisma Plantago.

Juncus bufonius.

Scirpus lacustris.

Dactylis glomerata.

4. There is another mode of distribution—that of *interrupted areas*, as it may be called—to which we may request the attention of our readers. Perhaps the most common form of it is this :—Plants occur pretty frequently in a colder region, and at a moderate elevation above the level of the sea ; and then after disappearing in wide intervals, and in temperate countries, they re-appear on the sides or summits of mountains in warmer parallels. A late writer on the Flora of Lapland found 108 phanerogamous species growing in that country, and to be found also on the Alps ; besides these, he discovered 18 species common to Lapland and the mountains of Scotland, and not to be found on the Alps. Of these, about 30 are not discoverable in the intervening countries, either on the mountains or the plains. For example, *Thalictrum Alpinum* is found :—(1), Around the arctic pole in both hemispheres ; in Europe as far south as Sligo in Ireland, and Caernarvon in Great Britain ; in Sweden and Finland, and near Moscow and Casan ; in Asia it exists on the Altai mountains ; and in America as far south as Newfoundland and Canada :

(2), on the Pyrenees : (3), on the Alps throughout : and (4), on the Caucasus. It is not found on the mountains in the north of Germany, on the Carpathians, or on the ridges in Turkey in Europe. Its southern stations are thus from 250 to 300 leagues from those in the north.

A curious instance of this interrupted area as regards longitude occurs in the well known *Rhododendron ponticum*. Its most westerly habitat is in the mountains of Algarve in the south of Portugal, at an elevation of 3000 or 4000 feet ; it then trends south-eastward to near Gibraltar, where it rests for a little on the western extremity of the Sierra Nevada ; after that, in a long leap, it bounds over Etna, and the hills of Southern Greece, and alights on the heights near the western coast of Asia Minor, about the 40th parallel of latitude, clothing the Asiatic Olympus ; it then runs along the eminences of the northern shore of the Black Sea to the lower ridges of the Caucasus and of Northern Armenia. It probably exists also in the interior of Asia Minor, and in Kurdistan, where we suppose it yielded the honey which affected some of Xenophon's soldiers with madness, in the famous retreat of the Ten Thousand. It occurs also in Syria. M. De Candolle enters into a curious discussion of the physical conditions, which, as he imagines, limit the distribution of this shrub.—*Geog. Botanique*, p. 199.

The occurrence of the different species or varieties of Cedar also affords a curious subject of speculation to the Geographical Botanist. There is the African Cedar growing on Mount Atlas, we shall assume about lat. 34° , for the writer of this paper regrets that he has no definite information relative to its whereabouts and height above the level of the sea. There is the well known Syrian species still occupying its old haunts, at an elevation of some thousand feet, on Lebanon and Taurus, nearly in the same parallel. And there is the beautiful *Deodar* cresting the sides and the lower summits of the Western Himalayas in a latitude not much farther south, and at an elevation of from 6000 to 10,000 feet above the sea. How remarkable if they should turn out to be varieties of the same species, as is not very unlikely ; for certainly Endlicher's discrimination of *C. Atlantica* is founded on data of little value. And how curious to think of these three Cedars, whether they are species or varieties, as originating at a time when perhaps the peaks of Atlas, Lebanon, and the Himalayas towered over a great Mediterranean ocean covering what are now the more level regions of the torrid and the temperate zones.

This idea, together with certain of the facts stated above, suggests some of the more speculative questions in Botanical Geography, viz., the origin of the species, their supposed propagation from local centres, and the breaks in the continuity of their distribution, which questions, however, we must reserve for further discussion when we have more of the facts before us—that is, if the patience of our readers will accompany us so long.

OBSERVATIONS ON GARDEN SEEDS IN GENERAL.

BY MR R. ERRINGTON, OULTON PARK, TARPORLEY.

IN later times our garden seeds have multiplied to such an extent that the most experienced persons are somewhat puzzled to select. Our catalogues are indeed full to repletion, and if varieties multiply in a similar ratio during the next score years, a catalogue in 1877 will be a most ponderous affair—few men will choose to carry one. Now, if this be a fault, it is a fault not of the seedsmen alone; the public may in great part blame itself. There has been such a desire for progress, that any novelty, however false it proves, is readily hailed by one portion of the public. Our exhibitions, too, have much enhanced the esteem for novelties; with what eagerness do we see people crowd around a bench where there is a new Potato, a new Turnip, or indeed anything else that is fresh, whilst the most superb specimens of older date receive but a glance, as things familiar and commonplace. However these things may be, a good gardener eyes novelties with jealousy: alluring as the bait may appear, he has seen the trap so many times that he is shy of setting his foot on it. Now, this of course may cause inexperienced persons to impute prejudice to them; but good gardeners, as a class, are behind no other in society as to freedom from prejudice. My purpose here, is to offer a few remarks on the chief families of vegetables; and in so doing, to point to good old kinds, as well as to admit progress where it has been really made.

PEASE.—Here we have an endless variety; he is a clever person who knows how to select for a garden of moderate pretensions. And what can the townsman do who holds a suburban garden of a quarter of an acre but rush in a hurry into the first popular seedsmen's shop as he leaves his office, and hastily inquire which is the best Pea? Such seedsmen generally know about as much as himself, but they have their wares to recommend; and who would not sooner sell a new kind at half-a-crown a-quart than a Bedman's Imperial at eightpence? But to be fair in this case, great improvements have indeed taken place in Pease. There appears to have been an attempt by some parties, and a very laudable one, to produce a really Dwarf Pea possessing all the qualities of the old tall Marrows; and it has been accomplished. This was a great desideratum, and has arisen, no doubt, from the Pea-stake question, which has ever been an awkward one. We have now several kinds possessing such qualities, and only 30 to 36 inches in height: this is a boon. We have also an intermediate class of some value, possessing a smack of the Marrow character; these are good succession Pease. As such I would especially point to the "Champion of England," as some call it, but there are others equally good. As to

very early Pease, I am not aware that a week's advance has been made during the last 40 years. Every season brings forth some so-called new kind, but I for one can see little difference between them and the true "single blossomed Early Frame" of 40 years' since. At that period, people had got tired of the constantly recurring term, "Early Frame," and so about the years 1815 to 1820 we had a change of names—the "Early Cobblers," the "Nimble Tailors," &c., came in, in due time, succeeded by the Racehorse Peas, and these fleet animals in their turn were superseded, as well they might be, by the "Railway Pease." "What's in a name?" may well be asked—the inquiry not confined to gardening. There is yet another Pea to come out this season I believe, which, if I mistake not, will have a considerable run. This Pea is not above ten inches in height, and crops as early as the Emperor or any other, for I have tried it two seasons. It will doubtless prove a most valuable forcing Pea, as it might be grown in pits or frames as readily as Potatoes—its great merit in this case being that it will not "draw," to use a mere gardening phrase, signifying an undue lengthening of the stalk.

BROCCOLIS.—Here we have another family which has increased in multiplicity of names almost equal to the Pease. But there really is not so much novelty in them after all. We still have autumn Broccolis, midwinter kinds, and late spring sorts, and I am not aware that a single point has been added to their earliness in the autumn, or their lateness in spring, or to their hardiness—the last, perhaps, the most important feature. The celebrated Cornish Broccoli which makes such a noise in the London market in February is not new. That it may be very pure as to its kind there can be no doubt, or it would not occupy so high a station; but it is doubtless not far removed from Snow's, the old Impregnated, the Protecting, &c. The point we want to gain above all others is hardiness; one other point, the property of producing heads in midwinter.

CABBAGE.—In this family a very considerable advance has been made, but of the good kinds our market gardeners and some few others have, few can get possession. The great point gained in later years is the acquisition of a dwarf class of Cabbages, which are no sooner a strong plant than heads are produced, and this with as little outside foliage as possible. The merits of this race do not end here; they may be planted twice as close as the large old kinds, and at almost all periods from February to October, and they are adapted for small borders, for mixed cropping, and equally for large gardens as for smaller. In former days we had monstrous Cabbages which were annually planted in October, and on these the cultivator relied for his chief produce, depending in no small degree on the sprouts which proceeded from them. The improved kinds to which I allude are known amongst market gardeners by the name Cole-worts, which term is understood by the inexperienced in Cabbage culture to mean some particular kind or variety. That such are im-

proved breeds there can be no doubt, but a Colewort in market gardening phraseology simply signifies any dwarf kind of Cabbage, sown at a certain period to meet the wants of the market and to tie in bunches. I mean not here to repudiate the fine large Cabbages of the olden time; they were noble fellows to be sure, and where true to character, may still be encouraged for especial purposes. Nevertheless, the others are so convenient, as coming in constantly fresh, and being qualified for monthly sowings from March to August, that they must continue to stand in the van of all Cabbage culture.

CARROTS.—Here we have nothing more worth recording; the old Altringham yet maintains its superiority as a main crop Carrot, and the old Early Horn, if true, is still unequalled as an early garden kind. Some of the newer kinds profess to be of superior flavour, but this is a very doubtful affair. Some depend on a mere difference of colour.

LETTUCES.—There are now a great variety of kinds in the market, and some very excellent, but they seem mostly of the White Cos section, or what is now called the Paris Cove Cos. The true Bath Cos is still unsurpassed, especially for winter and spring use; and the old Hammersmith, as a winter and spring Cabbage Lettuce. There are, nevertheless, some very good new kinds possessing much size.

CELERY.—The kinds known by the name of Coles' Superb are amongst the best in cultivation—best at least for gardens of moderate size. What is called the Manchester Red is better adapted to the market gardener; it is too coarse for gentlemen's families, but it makes a large Celery in less time than most others. There is a new kind called Turner's Incomparable, a very dwarf Celery, which I think of very superior character, although it makes little show; it is amazingly adapted to very small gardens.

PARSLEY.—This valuable herb has been improved in later years to a very high pitch. There are several varieties, but it is difficult to choose; the fact is, it is almost impossible now to get a bad Parsley.

ONIONS.—No advance here worth notice; indeed, I do not see what more can be desired in this family, except high culture and an avoidance of that pest the grub.

BROAD BEANS.—There is here a new kind called Mackay's Wonderful, which I have grown this summer, and can highly recommend. The pods are of enormous length, and fill well.

SAVOYS.—The yellow improved kind called, I believe, Ulm Savoy, is a capital sort, and more dwarf than the old green; therefore it may be planted closer, and is eminently adapted for small gardens. It is peculiarly tender.

KALE.—The new Cabbaging Kale can hardly be planted too extensively; it is a most delicious green, and when pure, forms a

nice head. Melville's Kale is highly spoken of, but I have never grown it.

·ENDIVE.—No novelties in this family—they are always the same; indeed, if we can but get the dwarf compact kinds of Curled and Yellow Batavian, there is little to be desired.

BEET has been much improved during the last few years. Barratt's Crimson, if true to name, is a good scarlet Beet, but it is sadly degenerated of late. The black Beets are most to be relied on. Beets for salad should be grown on poor soil, and not sown before the middle of May; they are, thus treated, finer in texture, and more tender.

It is almost useless to refer to other vegetables, as these comprise the chief families of the kitchen garden. I may here observe that persons purchasing seeds—for the time is at hand—should do so of persons of known high standing in the trade. These men have a character to lose of more value than shops of dashing and ephemeral character. The purchaser should also explicitly state his object; this will enable the respectable dealer to do all in his power to give satisfaction. And let me recommend more attention to high culture and the keeping down of weeds—at least, below the seeding point; this will be found to profit more with well known kinds than the searching after mere novelties.

We all know what a fuss was made about the New Yam or Dioscorea Batatas. Hundreds of pounds changed hands by the introduction of this root; and what has become of it? We may look in vain in the pages of our gardening periodicals for its very name, at least during the last six months. And yet this paltry root was lauded on all sides; Frenchmen and Englishmen vying with each other in extolling its wonderful merits. Many of the readers of the *Scottish Gardener* will doubtless remember too the celebrated Cow Cabbage, which had an immense run a score years since, and which was to prove such an agricultural acquisition; the stems, moreover, to serve for rafters to buildings after the heads were cut. Lest, however, it may be inferred that I am for checking progress, I must say a few words in favour of occasionally making trials of more varieties in certain families of vegetables. It is not progress of a genuine character that myself or any man in his senses would impede, but the march of deception and humbug; and we all know, that in these days much caution is requisite in this respect. The trials of new kinds to which I would allude, are of such families as Broccoli, Cabbage, Celery, Beets, and Lettuces—these especially. The fact is, that the old kinds, although once good whilst realising high prices, somehow fall off when they reach the ordinary price. There is no marvel in all this—who would not sooner grow a new Cabbage for seed which will sell at 2s 6d per oz., than an old kind, however good, which will bring only 9d per oz.; and the one requiring the same space and same conditions as to expense as the other? The thing is manifest, and I suppose must, of necessity,

continue in the same position. Whilst a new thing therefore realises a high price, more pains are taken over it, inasmuch as it pays better for pains; and for two, at the most three, years, we may expect to get a good Broccoli, a good Cabbage, or a Celery—that is to say, pretty true to its name. In all this there is no more blame to be imputed to the seedsman than to other tradesmen; the same motives actuate each, and it is vain to look for persons devoid of self-interest.

Surely the same may be said of patent medicines. Daffy's Elixir, Dutch Drops, Opodildoc, &c., have had their day, and why should not garden seeds?

COMPARATIVE HORTICULTURE.

6.—NOTES ON THE VINEYARDS IN FRANCE.

WE have retained our usual title, though the subject of this paper relates not to gardens, but vineyards, which belong rather to agriculture; and we have done so, in the hope that our readers may gather from it some hints which may be useful in their vineries. They will see from these notes, as well as from Mr R. Thompson's interesting account of his visit to Fontainebleau and Thomery, copied in our last number, that the French restrict their Vines within narrower bounds, prune them more severely, and manure them less copiously, than we are in the habit of doing in this country. The notes, which are by no means complete, for our limits forbade us to enter into the French methods of summer pruning, pinching, &c., are chiefly gathered from Comte de Gasparin's excellent *Cours d'Agriculture, Tome IV.*, and M. Rendu's magnificent *Ampelographie Française*.

1. *Vegetation of the Vine*.—In its natural state the Vine is a creeping shrub. It yields its greatest products, when it is trained to a considerable altitude; but then the Grapes receive only the heat diffused through the atmosphere, and not that reflected from the ground; the fruit is watery, with little sugar, and contains much free acid. These circumstances have induced cultivators generally to keep their Vines low by means of pruning.

The Vine is sensible to excessive cold. Strong frosts split the wood of old stocks, and affect even the roots. Many plants were lost in the south of France in 1789; and particularly in 1830 by colds in January and February, when the thermometer sunk to 10° and 9° Far., the latter year being more fatal to the Vines in the south than in the north, as in the south the ground was not covered with snow. M. Cazalis-Allut has remarked that the effects of cold are felt for several years after the injury has been sustained. A vineyard of Muscat Grapes of 3.10 hectares, (7½ acres) in extent from 1820 to 1829 produced 515 hectolitres, (11,330 imp. galls.)

of wine, and after the winter of 1829, from 1830 to 1839 only 248 hectolitres (5456 imp. galls). Sudden frosts also destroy the swelling buds when they are covered with ice, (water frozen in falling), and when the cold is powerful enough to penetrate into the heart.

In developing itself, the shoot presents a succession of leaves which are opposite to peduncles carrying rudimentary bundles of flowers, or tendrils. The tendril is only a transformed peduncle, which may often be converted into a bunch, by cutting off one of the two branches of the tendril; that, viz., which has only a little roughness at its extremity. In good years the bunches increase at the expense of the tendrils, and *vice versâ* in bad ones. This latter conversion—viz., bunches into tendrils—is favoured by the dampness of the soil, combined with heat, when vegetation is most active. Whence the proverb: *Année de foin, année de rien*; which may be rendered:

When there's plenty of hay,
Vineyards don't pay.

The Vine shows its flowers when the mean temperature is about 62° Far.; it is in full flower when it reaches 65°; and it goes out of flower at 68°. During the time of blossoming new dangers occur. Frosts kill the flowers: rains and fogs dissolve the pollen, and render it sterile. On this account, sorts late in flowering are preferred. Failure in setting (*coulure*) is least common in the south; or where the spring is more than usually dry.

All leafy plants evaporate much moisture. The Vine is one of the plants which overcome most effectually the affinity of the earth for water; and it therefore succeeds on lands where many others would perish. Planted on a thin soil, where the roots of all trees can penetrate only to a certain depth, the following trees wither and lose their leaves in the order enumerated:—The Lime, the Acacia, the Plane, the Ash, the Mulberry, and the Vine.—*Comte de Gasparin*.

Soils suitable for the Vine.—It is next to impossible to find one kind of soil which does not furnish celebrated wine growing on its surface. The Vines of the Hermitage are situate on a granite soil; those of Anjou on argillaceous schist; those of Lamalgue, near Toulon, on micaceous schist; most of the vineyards of Cape Breton (Landes) on quartz sand; those of Medoc on quartz sand, mixed with pebbles and gravel; those of St Gilles and Chateaufort on a very siliceous decomposed limestone, mingled with pebbles of quartz; the Cote-d'Or exhibits Vines on oolites, marls, magnesian limestones, tertiary alluvium, and lacustrine deposits; the Vines of Champagne grow on chalk; &c. [We understand some of the above mentioned minerals to form the subsoils; and the superjacent stratum of ordinary mould to be largely mixed with them. The quality of the wine is the true test of the soil, annually applied; and it is not to be supposed, that though some form of all these kinds of soils

produces good wine, every modification of them is equally adapted for the purpose. The differences in the qualities of the wines is a sufficient evidence to the contrary. Our impression, from a pretty careful perusal of the *Ampelographie Française*, is, that Vines succeeds best on sites and soils where there is good natural drainage. Stagnant water is highly injurious. On the banks of the Garonne, which is the most humid wine-region in France, the Vines, in flat situations, are grown on elevated ridges, or provision is made, by means of drains or ditches, for keeping them sufficiently dry.]

It is observed that on dark coloured soils, Grapes ripen most rapidly, because these soils absorb the luminous heat of the sun, and become warmer than others do. It is thus that the ripening of bunches is hastened by their being placed on black slates. When the soil is composed in great measure of small stones and pebbles, the heat penetrates more deeply, and is longer retained; but the evaporation is also more considerable, and the Vine is apt to suffer from drought. This inconvenience is not suffered if the stones are on the surface, and the interior is of well worked and fresh earth. In the environs of Tain, the bunches of Grapes are surrounded with large stones, which become warm in the sun, and reflect the heat upon the berries, and so accelerate their ripening. M. Rozier proposed to pave vineyards—a scheme which excited much ridicule, but which was chiefly objectionable on the ground of expense.—*De Gasparin*.

3. *Manuring of the Vineyards*.—[It is difficult to gather precise information on this subject from any of the books in our possession, and probably the procedure varies much in different parts of France. It appears, that if the ground has been previously occupied by Vines which have been removed on account of exhaustion, it is subjected to a four years' agricultural rotation, chiefly of green crops, before it is replanted. If the ground is new, it is trenched to a suitable depth, and is at once planted either with simple cuttings or rooted sets. If we understand Comte de Gasparin aright, manure is seldom or never given till from the fourth to the twelfth year—say the seventh or eighth year in the south of France, and later in other parts of the country. By that time the original vigour of the soil is expended, and it requires aid from without. M. Rendu, however, speaks of manure as given in some places as early as the second or third year.]

When the soil has passed the term at which the Vine enters on its stationary condition, M. Louis Vincent gives to his vineyard, at Aymargues (Gard), 18 loads of dung of 2000 kilogrammes per hectare every four years, that is 9000 kilogrammes of manure per annum, or $12\frac{3}{4}$ cwt. per acre yearly. This manure is the dung of sheep which are fattened on the heated residue of the wine press, and bedded with reeds. On the banks of the Lake of Geneva, M. de Nyon applies $15\frac{1}{2}$ cwt. of manure to the acre per annum.

Besides the manure from the farmyard, green manures might be

employed with advantage, and with little expense, as the ground between the Vines must be worked at any rate. For example, Lupins or field Beans, sown after the pruning in autumn, or in spring, and worked in green, would give a rich and economical manure.—*De Gasparin*.

4. *Distance between the Plants in the Vineyards*.—The growth of the Vine varies in vigour according to the climate. It is strongest in the south, and goes on decreasing towards the north. On this account the distance between the plants is greatest in the south, in order to allow a sufficient cube of soil for an adequate supply of sap.—*De Gasparin*.

In Provence the Vines are planted sometimes in single, and sometimes in double rows. The single rows are placed from 11 or 12 feet from each other; and the interval is occupied with ordinary field culture. The double rows are at a distance of about 40 inches from each other, with an interval of 13 or 14 feet between each pair. This mode of planting is almost exclusively confined to Provence. At times, even in that district, the Vines are planted *full*, that is in lines of equal distances of about 40 inches between the rows and 40 inches in the rows.—*M. Victor Rendu, Ampelographie Française*.

Comte de Gasparin represents the matter in another way. The following is a specimen of a table exhibiting the practice of 24 localities, the first column denoting the number of plants in a hectare, which is equal to 2.47 acres; the second column expressing square metres, each equal 1.193 square yard; and the third the distance between the plants in lineal metres, each being 3.28 feet.

Chateaneuf-Calcernier (Vaucluse)	2500	4.	2.
Medoc	6944	1.44	1.20
Marseille	10,000	1.00	1.00
Cote-d'Or	23,365	0.43	0.66
Ain, Vosges, Pithiviers	40,000	0.25	0.50

From this we learn that the area allotted to a plant in the vineyards of France varies from 43 square feet to little more than $2\frac{1}{2}$ square feet.

In the last named locality, Pithivier, an experiment was tried in the way of enlarging the areas occupied by the Vines. They were planted at 2 metres ($7\frac{1}{2}$ feet) distant from each other. The individual plants bore more grapes; but the gross product on the same area was less, and the wine was inferior.—*De Gasparin*.

5. *Pruning and Training of the Vine*.—When the Vines are grown low and without trellises, the Vine plant is kept more or less of small dimensions, according to the nature of the soil. On dry ground, and with vigorous varieties, it is sufficient to allow the stock to be 3 or 4 inches in length, below the separation of the branches; in other circumstances, it may be 8 or 12 inches. At that elevation the Vine is trained to send forth its main branches or horns (*cornes*) to the number of two, three, four, or even five, according to its

vigour—most ordinarily it has two or three horns. This part of the training is commenced in the first year, and is completed generally in the third or fourth. These main branches are disposed *en gobelets*, i.e., in the form of a cup, and upon these the bearing shoots are produced annually.

The manner of forming the staked or trellised Vines is much the same; only they are not kept open in the centre, and by means of ties are led at once in the direction of their supports. The Vines particularly adapted for this form of training are the sorts which show a tendency to extend themselves before they become productive. If kept within too restricted limits, they yield little except shoots and leaves. We (De Gasparin) experienced this in a plant of the Corinth (Zante) Grape brought home by the expedition to the Morea in 1828. Pruned short for 14 years, it bore only a small quantity of Grapes, and we kept it merely as a specimen of the kind. Having been left to itself, it crept over the neighbouring trees, covered itself with fruit, and bore such a crop in 1847, as would have made a hectolitre (22 galls.) of wine, if the whole fruit could have been gathered. There are other sorts of Vines, which when abandoned to themselves, produce nothing but wood, and so speedily cease to be fertile. These different modes of growth give rise to two kinds of pruning—the long style with the horizontal or curved direction of the shoots in the case of the first; and the close style for the second.

In the strong growing kinds, a shoot of the preceding year is reserved, and cut so as to leave eight or ten eyes. This is bent back into the shape of a bow, and is fastened to the trunk of the Vine or to its stake. This shoot is called *aste* in the Bordelais, and *pleyou*, *courgée* or *verge* in other quarters. In the following year this shoot is cut away, and another is placed in its room. (*De Gasparin*.) In the north-east of France where the *taille en courgée* prevails, two, three, or four shoots, according to the strength of the plant, are thus bent back in semicircles, and are attached at their extremities to the stake by which the whole is supported (*Ampelographie Française*).

In the less vigorous sorts the pruning is directed so as to concentrate the sap into a small number of shoots. The Vine is trained to three, four, or five principal branches. From these branches, all the shoots are removed except one, and that the strongest. This is cut back to three eyes or buds, viz., two on the new wood, and one quite close to the old wood, which most frequently is allowed to develop itself only in case of accident happening to the others. It is therefore called *œil dormant* or sleeping bud.—(*De Gasparin*.)

It is known that the eyes at the base of the shoots of the Vine grow very closely together, and are very small; there are sometimes not fewer than six in the extent of one quarter of an inch. When the shoot is pruned too long, that is $1\frac{1}{2}$ or 2 inches long, these small eyes do not push; but when it is pruned more closely, they develop

themselves perfectly, and produce excellent bunches of Grapes. Skilful gardeners are not ignorant of this, and they always prune within 1-12th of an inch of the old wood or even less. Thus the spurs do not become elongated in their hands. Those who are not acquainted with the organisation of the Vine, cannot understand how a spur which has sent forth fruit-bearing shoots for 20 years, should not be above $\frac{3}{4}$ of an inch long.—(*Bon Jardinier on the Thomery system of Culture.*)

6. *Layering of the Vine in the Vineyards.*—[This is a method of treatment which is common throughout France, and is called *provinage*. The produce of Vines under ordinary culture has passed its maximum about their 25th or 30th year from planting, and begins to decline: to obviate this evil various remedies are applied, such as manuring, and especially layering. The following is the practice in Burgundy, including the ordinary winter pruning as given in the *Ampelographie Française*.] The epoch of pruning is determined by the state of the weather towards the end of winter, and takes place generally from February 15 to March 10. According to the strength of the plant the young shoot is cut to 2 or 3 buds, and sometimes to a single one. In the pruning, those Vines are omitted which are destined to be layered. In well kept vineyards they are marked, and such are selected as are most vigorous, are most capable of enduring atmospheric influences, and bear the best Grapes. At the conclusion of the pruning comes the layering. Nothing is more simple. As far as possible, those Vines are chosen which are furnished with shoots of equal strength. Trenches, 40 inches long, 12 inches broad, and 15 inches deep, are dugged on the upper side of the Vine stocks [which mostly grow on slopes]; the shoots are carefully bent down into the trenches, and their points are turned up, say one at 13, and another at 26 inches from the original stock, and the earth is filled in. These turned up points are pruned to three buds, and yield some fruit the first year, and abundantly the second. This practice, to some extent, occurs annually in all vineyards of superior character. The layers are never severed from the parent stems, which, in some of the great vineyards, are three or four centuries old. The layered branches pass under the earth to considerable distances, and cross and recross each other in all directions, so that the Vines are no longer spaced at regular distances from each other. The extent of this layering varies with the wants of each locality. At Volnay from 250 to 300 trenches with layers of two points each per acre are made every year; at Nuits about 200. The work is performed in the end of winter and in spring.

7. *Comte Odart's Opinion of the Black Hamburg Grape.*—This Vine, which I have had for a long time on a wall, and grafted on a Muscat, has never, notwithstanding this double attention paid it, yielded me Grapes which I could eat with pleasure or could venture to offer to others. Every year I have eaten the finest of the berries rather to acquit my conscience than for any enjoyment I had in

them, and I always regretted to see that sort occupy so good a place. On my wall the fruit was sweet enough, but of a dull and palling sweetness, and was never crisp (*croquant*) like that of our best sorts. Nevertheless, it is a Grape which is quite to the taste of hornets and wasps.—*Ampelographie Universelle*, p. 332.

HINTS ON THE CULTURE OF THE MELON.

BY MR A. FOWLER, CASTLE KENNEDY, STRANRAER.

MANY varieties of structures are, and have been used for growing Melons. There are the old hot-bed and frame; the dung pit with its many varieties; the pit with common flues; and last, though perhaps best adapted of any, the span-roofed pit, heated with hot-water, where the Vines of the Melon plant are trained to a trellis, as in an ordinary Vinery, and where the fruit hangs from the trellis fully exposed to the beneficial influence of the sun and air. In this class of structures the Melon season may be much extended, as they can be produced both earlier and later, and in greater perfection than in either dung pits or frames.

From a variety of causes, perhaps principally on account of the first cost, erections of this kind are not in such general use as could be desired. I believe three-fourths of all the Melons grown in this country are either grown on the common hot-bed, or in dung pits. Seeing that such is the case, perhaps a few hints on their general management in hot-bed frames may not be unacceptable to some of your numerous readers.

Suppose it to be decided that forcing is to commence the first week of March. If horse-dung is to be used, it should be laid down in the Melon ground early in the third week of February, to be immediately well shaken out, and thrown into a heap to ferment, watching carefully that it is not too dry, or taking too great a heat, becoming what is technically called burned, changing its natural colour, and becoming white in appearance, to a great extent losing its value both as a fermenting material and as a manure. To guard against this, the heap should be well shaken out, and turned two or three times, never allowing it to take a very strong heat. Leaves should also be collected in abundance during the winter, and packed in some convenient place, and well tramped, which retards fermentation, leaving them in a fresh state for use when wanted in spring. If cow-dung is to be used, then less trouble is necessary in preparation, it being of a cooler nature, less leaves are also required—say in the proportion of one-third—this makes an excellent and lasting bed.

Materials being ready, and the forcing season come round, a one light frame for a seed bed will be sufficient to begin with; measure the frame, allowing eighteen inches additional all round when mark-

ing the base on the ground, then commence the bed by using dung and leaves in equal proportion—supposing horse-dung to be used—raise the bed from four to five feet in the front, and from five to six feet in the back while building, beating it hard and regular all over with the back of a fork, finishing with a layer of six or eight inches of leaves, which are less liable to take a strong heat than dung. The bed being thus prepared, place a frame on it, shutting close down. As soon as the heat is fairly up, and the thermometer when hanging in the frame, showing at night from 60° to 70° , preparations may be made to sow the seed.

Most Melon growers prefer seed which has been kept for some years; it being believed by many, that the plants grown from old seed are not so luxuriant in their habit, and that they are more productive. There may be some truth in these opinions; as a general rule, they may be less luxuriant and more productive than plants grown from newer seed. But I cannot help here observing, that I have frequently sown Melon seed ten or twelve years old, along with seed of the previous year, little difference being observable, either in the luxuriance of the plants or their productiveness, both producing abundant crops. Seeing, then, that good crops of Melons can be produced from new seed as easily as from old, either may safely be used.

Pots should be well drained, and filled with good fresh loamy soil when the seed may be sown, covering with about one inch of soil. The pots should then be plunged in the frame; six or eight inches of sand, sawdust, or other material, should be used to plunge in, and assist in keeping down steam, which is sure to be produced less or more in a new bed. A little air should also be admitted at night, to keep the atmosphere of the frames sweet, and allow steam to escape; a chip of wood a quarter of an inch in thickness will be found sufficient to put below the back of the sash, at least till the plants are showing above the soil, which they may be expected to do on the second, third, or fourth day after sowing. The thermometer should be kept at from 60° to 70° at night, allowing it to rise ten or fifteen degrees during sunshine; admitting air on every favourable opportunity, and always during the early part of the season, by pegging up, instead of pushing down the sash; by this means preventing a cold current of air from blowing down on the tender plants, which, at this stage of their growth are very susceptible of cold. In eight or ten days the plants will be ready for transplanting into nursing pots; a warm day should be chosen for the purpose,—pots, soil, crocks, &c., should be put into the frame a day or two before being used, so that the young plants may receive no unnecessary check; three plants should be put into each pot, and the centre of each pinched out, if they have shown their second or rough leaf,—if not, this must not be omitted when they do so. For a few days after being transplanted they will require to be slightly shaded during sunshine. A good rule is not to allow them to flag for want of

shading, nor to shade them when they will not suffer without it. Slight waterings with tepid water will be occasionally required; the water should be at least as warm as the atmosphere in which they are growing.

The linings will require considerable attention; they must be added to and renewed when required, so as to keep up the heat of the bed, raising them well up around the sides of the frame, but not so high as to come in contact with the mats which cover it, during the night, otherwise steam will be sure to find its way into the frame, and destroy the plants.

By proper attention to airing, watering, &c., in about five weeks they will be fine, strong, well-established plants, ready for ridging out in beds, where they are to produce their fruit.

Suppose materials in sufficient quantity for a thin light bed to be collected and prepared; in forming it, the directions previously given for a one light bed will be applicable. As the season will now be advanced to the second week of April, it need not be above four feet in height in front, and five feet in back. The bed being finished, and frame set on, and after allowing a few days for the heat to rise, preparations should then be made to ridge out the plants. A good loamy soil, rather heavy than light, collected and thrown into a heap some months before being wanted, will be found well adapted for growing Melons; a surface spit from an old pasture, or what is perhaps better, the same taken from the side of some country road, which is frequently much enriched by the washings of the road being thrown upon it for generations. Some Melon growers may object to using the soil so new as recommended above. If well broken when put into the frame, the result will certainly be satisfactory. The rapid decomposition of the vegetable matter contained in the soil accelerated by the heat of the bed, supplies abundance of food for the plants.

The soil should be rather dry than wet when used; a ridge two feet in breadth, one foot in depth, and the length of the frame, should be made to run along the centre of the bed lengthways, keeping the roughest of the soil to the bottom; a portion should also be spread over the remainder of the surface of the bed sufficiently deep to cover the leaves, for the purpose of keeping down steam, which must be carefully guarded against for some time to come. As soon as the soil in the ridge is properly heated, which will be the case in a day or two, proceed with the planting, putting three plants into each light, to be reduced to two after they are well established in their new quarters; for a few days after planting shading will be necessary during strong sunshine. Great care must be taken at this stage, that steam in excess does not find its way into the frame; it will be safe to leave a little air at night to allow of its freely escaping. Care will also be necessary during the day to give plenty of air, never allowing the thermometer to show much above 70° without a little being admitted, and as the sun increases

in strength, giving additional air, allowing the thermometer in hot days to rise as high as 80 °.

In the course of a few weeks the Melon plants will have made shoots one or two feet in length; at this stage it will be advisable to fill up the remainder of the bed with soil, to the depth of one foot as previously directed, tramping it hard around the roots, and all over the bed—this should only be done when the soil is dry. After levelling the bed neatly, four or five large panfuls of tepid water, run through a coarse rose, should be given to each light, so as thoroughly to saturate the soil. Slates should then be laid over the surface of the soil, placing them close round the stems of the plants, and around the sides of the frame. Among the many advantages of this covering, I may mention the prevention of evaporation, keeping the fruit dry and warm, absorbing heat largely during sunshine, and giving it out gradually during shade, &c. After the slates have been placed, it will be necessary to thin and arrange the shoots, leaving three on each plant, and leading them at equal distances towards the back and front of the frame. When they extend to within about a foot of the side of the frame, they should be stopped, which will direct the energies of the plants into the lateral shoots, which will now be appearing at the axils of the leaves of the leading shoots. All laterals showing at or within eight or ten inches of the main stem should now be rubbed off; indeed, during the whole growth of the plants this should be attended to with the utmost care, as when a crowd of foliage is allowed to accumulate there, the main stem is apt to be injured with damp during cloudy weather, laying the foundation of that disease which ends in the decay of the main stem, and thereby causing the whole or partial loss of the crop. In hot days, a sprinkling of water should be thrown over the slates and plants in the afternoon before shutting up; this will encourage a rapid growth.

If all has gone well, early in May male and female flowers will be found, particularly the former, in considerable abundance; *watering should now be discontinued for the season*, and every second day, any time betwixt eleven and two o'clock, preferring sunshine, the plants should be gone over, impregnating all the female blossoms—much depending on this being attended to for securing a full crop of fruit. This is not only necessary at this season, but should be attended to during the summer months, when later crops are in flower. The Vines at the same time should be pinched back to an eye beyond the fruit, which in a few days will push again, to be stopped permanently four or five eyes in advance. In a short time, a number of fruit will be set on the laterals, which should be thinned so as to leave only one fruit for each leading shoot (always selecting the best), which will be sufficient, except a small variety is grown; at least one-half the lateral shoots should be removed at the same time. It will be found good practice, every second or third day, to remove all shoots which are not really wanted, always

keeping the wood thin, so as to allow every leaf plenty of room to be fully developed, and on no account at any time to allow the slightest confusion to exist. Some may object that withdrawing water at the stage I have specified will hinder the fruit from growing to a good size; my experience proves just the contrary, sufficient moisture remaining to swell the fruit to a large size—the soil gradually becoming dryer as the fruit approaches maturity is also an additional advantage, being an essential condition to fine flavour.

Of course, it is understood that every attention is paid to linings, ventilation, &c., and as the season advances, the thermometer, with plenty of air on, may be allowed to rise to 85° or 90°.

SHANKING OF GRAPES.

I REGRET that the cause of the shanking of Grapes has not been more keenly taken up by the correspondents of the *Scottish Gardener*. It is a subject in which I am much interested, and I had hoped that the correspondence regarding its supposed cause would have been more abundant and varied than it has been, so that some satisfactory information might be gleaned from a variety of conflicting opinions.

The Editor in the number for May asks the following questions regarding shanking, and to these I shall endeavour to give answers—

1. Has shanking anything to do with the imperfect fertilisation of the Vine blossoms? This question he himself answers in the negative. The seeds of shanked berries vegetate freely, except in inveterate cases, when the Grapes have shanked when green. Imperfectly fertilised berries not unfrequently ripen and remain free from shanking, while on the same bunch many of the finest of the berries were shanked.

2. Is shanking the result of nature relieving herself of what she cannot mature? I believe it is. And I am of opinion that the causes which produce this state of the Vine are various—such as a wet saponaceous border; a border too much raised above the ground level, and liable to be too dry in hot weather; injudicious summer pruning; admission of the external air in excess, which causes too great an exhalation from the leaves; a too high night temperature, which causes an excessive transpiration of the juices of the plant, without a corresponding degree of air and moisture; and a too low temperature, such as often occurs in greenhouse vineries.

These are a few of those causes which, either separately or combined, are likely to induce an unhealthy state of the Vine, and to impair its vigour, so as to cause shanking.

3. Does the evil of shanking commence in the fruit stalk, as the name seems to indicate, or does it first appear in the berry? So

far as my observation goes, both fruit and stalk are simultaneously affected; the practised eye can readily distinguish berries that are likely to shank before it makes its appearance in the stalk, from their deficiency of colouring matter, or from their flaccid appearance in a greener state. If the want of a proper supply of sap be the cause of shanking, some of the berries will be supplied at the expense of others, which will die, or, in other words, shank.

4. Are there any traces of a sudden check in the growth from causes affecting either the leaves, the branches, or the roots? Vines may receive a check sufficient to destroy their power of producing a sound crop of fruit, without the cause being very apparent in either leaves or branches. Growing them rather below their natural summer heat would, to a certain extent, destroy their power of producing a sound crop of fruit—yet the wood might be strong, and the leaves large and apparently healthy. Violent checks will show their effects according to the causes which have produced them.

5. Are there any traces of minute fungi on the fruit stalks, or on any other part of the plant? I have not examined either Vines or Grapes microscopically. Fungi occasionally appear on the shanked fruitstalks, but I think their appearance more the consequence than the cause of shanking. If the atmosphere of the house be damp, or kept too close, fungi will readily appear; if kept dry and well ventilated, the shanked fruit stalks become dry and hard, without any appearance of fungi.

6. Has the flower of sulphur been applied to the bunches in the hope of arresting the progress of shanking? I have not tried flower of sulphur as an antidote to shanking, as I do not believe it to be the result of parasitic fungi. Leaves much injured by thrips and aphides may cause shanked and discoloured fruit. The fumes of sulphur in that case, timely and cautiously applied, is an effectual remedy.

Mr Cramb in his paper on shanking in the number for July, says —“I have never known shanking to occur where water was not allowed to accumulate in excess.” My experience and observations differ from Mr C.’s in that respect. I have seen severe cases of shanking where the borders were not surcharged with water, in situations where nature and art had combined to make them perfectly dry by means of thorough drainage and porous soil.

Have all those borders which have been made or re-made these few years past been spoiled in the making? Has the drainage been imperfect, the bottoming incomplete, and the soil of too tenacious a nature? I think not. A wet border is a cause of shanking, but is not the only cause, or certainly shanking would have been entirely got rid of.

“Dhaibhidh’s” Grapes shanked with him in his dry elevated borders as well as in those which were evidently low and wet. This experience then is so far at variance with Mr Cramb’s. Severe

cases of shanking often occur in situations where water cannot accumulate to that extent so as to destroy the roots of the Vine—as for instance on the dry chalky wolds in the east of England, and in many parts which have come under my notice where the vineries stand high and on a naturally dry bottom.

In such situations then, the drainage, bottoming, and the staple of the soil being all that could be desired, we might reasonably expect that shanking would be entirely prevented, if an excess of water in the border was the only cause; that, however, is not the case, and we must therefore look for another cause of shanking, and that in the dry elevated border.

An excess of water in the border and a compact saponaceous soil causes shanking, by destroying the roots of the Vine, and thereby cutting off the means of supplying it with the sap necessary for its sustenance. A too dry border will produce similar results, as it is through the agency of water that the necessary juices required for the perfect development of the plant is conveyed to it. No soil can sustain a healthy vigorous vegetation except the soil be permeated with air and moisture in sufficient quantity to suit the requirements of the crop grown on it. The Vine consumes a great quantity of water daily; and if the border be too dry, and the atmosphere of the vinery too arid, as it not unfrequently is, fine fruit cannot be obtained, nor can shanking be averted.

Many borders are made so dry as not to be able to sustain the constant demand on the roots for lack of moisture; in such cases the borders are raised to much above the ground level; the soil is open and porous, and the roots are planted too shallow, without the necessary precautions being taken to prevent any bad effects resulting from this too artificial mode of treatment. When Vine roots are planted shallow, *i.e.*, five or six inches from the surface, they should be occasionally watered during hot dry weather, and a covering of litter, slates, or boards should be left on the border during summer to prevent a too rapid evaporation until the roots push deeper and gain a more salutary and equable position as regards temperature and moisture.

I think 8 or 9 inches to be about the proper depth, at which the leading roots of the Vine should be laid. Under favourable circumstances the young roots will push upwards, and the main roots are less exposed to accidents and the vicissitudes of the seasons than when laid nearer the surface. A healthy Vine, when exposed to a high temperature, transpires a great quantity of water. This is a fact which should not be lost sight of in the management of the border, especially when newly made. It shows how necessary a constant supply of moisture is to the young rootlets.

A dry atmosphere and a too scanty supply of sap from the roots shows itself by the foliage being small, and the leaves spotted with brown, or what is usually termed burnt. Their surface is then being

reduced to accommodate itself to the supply of sap which the roots are able to procure.

Those who grow Vines in pots may easily satisfy themselves by well conducted experiments of the relative effects of too much water in the soil, or *vice versa*, in causing shanked fruit. A rather dry soil will affect the health of the Vine much more quickly than a soil partially surcharged with water. Shanked fruit is easily produced on Vines in pots by keeping them rather dry at the time of stoning, although in other respects they are treated precisely the same as those which are producing a sound crop of fruit.

Injudicious summer pruning is another cause of shanking, if the lateral shoots are allowed to ramble too far, and then receive a general shortening in, or be kept too close stopped. This like the too wet border, and that which is too dry, also tends to check the flow of the sap, and diminishes the quantity necessary for the proper development of both Vine and fruit; and at an advanced stage of growth will give the Vine a check which it will not recover for a season. A certain surface of leaves is necessary to draw up and elaborate the sap in proportion to the weight of the crop, and if the Vines are denuded of their leaves by too close stopping, the berries will be comparatively small, discoloured, and flavourless, if not shanked.

J. M., Carlisle.

THE PELARGONIUM.

BY MR W. DEAN, FLORIST, BRADFORD.

THOSE who have frequently seen the plants that take the foremost position at the London Exhibitions, and at the same time have had the opportunity of seeing the productions of growers in more distant parts of the kingdom, cannot fail to perceive that away from London generally, the knowledge of the proper culture of the Pelargonium is confined to a few. I say *proper culture*, because on this depends not only a supply of bloom, but that, too, of proper quality. Let not the amateur think because he has a supply of bloom, that it must necessarily be of *good quality*, and that because there is a flower, no matter what the treatment of the plant may have been, he is giving it in its proper character. Not a more erroneous opinion can possibly exist, and yet, if proper precautions are taken, a good supply of bloom of good quality is easily obtained.

The autumn being the best time of the year for purchasing Pelargoniums, where suitable houses exist for keeping them in, I have troubled you with a few remarks concerning this plant.

To the amateur, it is essential that the young plants have been well grown, not coddled in heat, but grown in a hardy, healthy manner. If in nursery pots, as they most likely will be, shift them at once into their blooming pots, say 6-inch pots, and place them in

a cool house, giving them plenty of air when practicable through the winter, of course excluding frosty air, but giving all the air possible, and keeping them free from damp. As a rule, amateurs are too fond of coddling (I am unacquainted with a more expressive word, and have to use it again) their plants during the winter, and keeping them in a close atmosphere. It is a great blunder, and should be avoided. *Air well* always in dry weather; and to counteract the effects of very cold winds, or for driving out damp, put on a little fire-heat. Tying out the plants must of course be seen to from the commencement. In the culture of florists' flowers, and in the Pelargonium especially, *air, light, cleanliness, and protection from damp*, next to proper soils, are the great requisites. *Air well*, by doing which, robust, healthy, and well matured growth is made, if the plant is not over-potted. Bear in mind, however, that *clear light* is an essential accessory. When the bloom buds are almost ready to burst, the application of a little weak manure-water now and then will throw size and colour into the flowers; but avoid administering much feeding matter before the buds are developed, or exuberant growth and a preponderance of soft wood may be the result. Do not be afraid of hard, firm woody shoots, for such material is necessary for good blooms. Sorts, such as Wonderful and Marvellous, invariably throw false blooms, and certainly not blooms in proper character, from soft wood, or from very young plants. Two and three year old plants, with old shoulders, suit these kinds much the best; and as a rule, this remark applies to Pelargoniums in general. After blooming time, place the plants out of doors to dry, sheltering them from rains, and giving very little water; and when the wood is well ripened, cut back the plants, and keep them in a house or pit, exposed to sun and air, but protected from rain—in fact, almost roast them, and they will soon push strong vigorous eyes; when the plants may be shaken out, root pruned, and re-potted into small pots, and placed in a close, shaded, *cold* frame—not watering them, but merely sprinkling them once a-day. In a few days they will begin to start root, when more air and light may be admitted, and a good watering applied. In two or three weeks after, the plants can be removed into the house, and kept well aired.

Many in writing about the propagation of the Pelargonium, affect an air of mystery, and actually invent obstacles where none exist. No plant is more easily grown from cuttings; for if they are placed in an exhausted Cucumber bed, or even out of doors, in a moderately shaded place, and exposed to the air, they will do exceedingly well. Of course I am speaking of putting in cuttings in July or the beginning of August, which is the best period of the year for doing so—the wood being then well ripened, or rather, should be so. Fancy Pelargonium cuttings require different treatment, and should be placed in a close, dry, cool house, and kept free from damp, and giving a little air occasionally and a little warmth as soon as they have calloused over. The Fancy Pelargonium also requires more warmth

during the growing period than the other kinds. Many persons fall into a great error in buying plants at the wrong time. No greater mistake can be made. I am of course referring to plants that have been properly treated in a nursery while in a young state. I have often seen orders come in when the blooming season was over: Cinerarias ordered in June; Pelargoniums in July and August; Tulips in January; Carnations and Picotees in May. These are periods of the year when such plants, if bought then, must disappoint purchasers. True, if wanted for stock, Cinerarias and Pelargoniums may be bought then, but purchasers should state this. The best time for having them is early in the autumn, if the purchaser has proper accommodation for them; if not, buy towards the end of February, or early in March.

The improvement in the Pelargonium within the last few years has been very great—the almost exclusive raisers until 1855 having been Messrs Foster, Hoyle, and Beck: but the latter gentleman has by no means maintained his ground as a raiser, and very few of his many recently introduced flowers deserve placing by the side of some of Hoyle's splendid varieties. Let it, however, not be forgotten that his Rosamond still plays a conspicuous part at our great exhibitions. Foster's flowers had an immense prestige at one time, but very few of his varieties now stand long. Attraction, now an old variety, is one of his best, but always requires opening or "thumbing." Meteora has the same fault, and is nothing without it; and in fact all his flowers hitherto, with but few exceptions, had the fault of being too much cupped, and were such as to compel the exhibitor to resort to *thumbing*, a process easily understood by the exhibitor. I need only refer to Optimum, Phaeton, Saracen, Seraskier, and others of Mr Foster's flowers, to illustrate the truth of my remarks. Mr Foster also, has hitherto confined himself chiefly to the production of high colour, and has unquestionably succeeded in producing intensely bright orange scarlets; but I am not certain if Mr Turner will not beat him; certainly he will in *form*, and probably in colour, with Seedlings he has to prove a second time. My opinion is that Mr Foster lost ground as a raiser in being so exclusive, and in not turning his attention to the production of new colours as well. Mr Hoyle has hitherto been the great raiser of Seedling Pelargoniums, and has given us more really sterling varieties than all the other growers together. His old variety Mochanna, is still extensively grown and exhibited, and his Leonora is still one of the best formed flowers in existence although sent out some few years since, for I have no means of ascertaining the precise period of its introduction. After that, in the autumn of 1854, there came from Mr Hoyle that glorious batch which included Carlos, Governor-General, Lord Raglan, Omar Pasha, Serena, Sanspareil, Topsy, and Wonderful—all flowers still holding a high position. The autumn of 1855 gave us very few new kinds worth having, while the autumn of 1856 gave us some gems from the hands of Messrs Hoyle and Turner: the former gentleman having turned out

great acquisitions in Agnes, a lovely flower when well done; Marvellous, a fine painted flower, but, as I before stated, should be bloomed from a two-year-old (or more) plant; Matilda, a beautiful flower; Diana, quite new and very pleasing; and Viola, a new shade of colour. Mr Turner, however, gave us some fine useful flowers, seedlings of his own raising, that will be grown for a long time, especially King of Scarlets; General Williams, an exceedingly fine flower; Miss Foster, a capital showy stage variety; and the spotted varieties Conspicuum, Spotted Gem, Mrs Hoyle, and Mr Beck—the latter being of exquisite form and quality, but unfortunately a shy bloomer. In the same autumn, Messrs Henderson & Son gave us Story's Prince of Prussia, the best of all the whites with a *small* blotch. Of the new Pelargoniums of this autumn, Turner has the lead, his Etna being a first-class, useful, bright painted flower. Rose Celestial, and Rosy Gem, will please; so also will Mazeppa, a spotted kind; and Imperatrice will please those who want a good showy stage variety, it being very large and free, but not first-rate in form. Mr Hoyle has very little that meets my views. Richard Benyon is good, but will want tolerable growth. Queen of Scarlets is very good, but small. There may be other good things among the new ones; but, at all events, the public have not seen much of them. Mr Foster's Minnie will, I think, be found a great improvement on his previous varieties so far as *opening* is concerned, and will be a flower that will please. Occasionally we have had from—to use the language of the turf—"an outsider" a really good flower. Look, for instance, at the old variety, Arnold's Virgin Queen, still the most constant, and, considering all points, the best white with full blotch we yet have. Hockens' Una is another very useful white, sent out by Mr Turner in 1854. The late Major Foquett also raised Magnificent some years since, and it is still grown; and subsequently Petruchio, a very useful stage flower. The late Mr Story directed his attention to the production of white Pelargoniums, and gave us Fair Ellen, a very free blooming but only tolerable variety; and subsequently two or three other kinds, the best of which is Prince of Prussia, which I have before alluded to; and this autumn gives us Lucifer, a fine variety from Mr Fellowes.

Much as the Pelargonium has advanced during the last five or six years, much has still to be done yet; and I shall be greatly mistaken if the autumn of 1858 does not give us some fine things from the hands of Messrs Hoyle and Turner. Mr Hoyle has for many years devoted his attention to the production of *form*—and who does not remember his Crusader of some years since?—coupled with new colours. Mr Turner has battled with Mr Foster for the production of brilliant colours, and is fast treading on Mr Hoyle's heels in the production of varieties such as have usually emanated from Reading.

The production of brilliant coloured varieties seems to have engaged the attention of the great seedling raisers at Clewes, Read-

ing, and Slough; for, as I observed, Mr Foster has devoted his attention chiefly to obtaining high colours, and Mr Turner has already given us King of Scarlets and Prince of Prussia; while Mr Hoyle has from time to time given us Basilisk, Colonel of the Buffs, Regalia, Magnet, Omar Pacha, Lord Raglan, and the extremely popular variety, Governor-General. The brilliant colours of these varieties are well known, and are all flowers that open well.

The Fancy Pelargonium is "going a-head" wonderfully! and Mr Turner has this flower almost in his own hands, so far as production of new kinds is concerned. Acme and Mrs Turner are two most beautiful varieties, but they will be surpassed next autumn—and who can tell what the Royal Nursery will yet give us in Fancy kinds?

The French Pelargoniums also improve, and they have become popular—I think on account of their being such very free bloomers, and producing—even with inferior culture—a somewhat satisfactory result. This is not the case with many kinds of the Pelargonium, because, unless *well done*, many kinds bear a striking resemblance to older sorts. The French Pelargoniums, on the contrary, have more novelty of marking and colour about them; and, indeed, some of the newer kinds possess great novelty of colour and greatly improved form. There is, however, a striking resemblance among some of the kinds.

EXOSTEMA FLORABUNDA.

THIS is one of those plants which deserves to be better known than what it is, if we may judge from the fact that it is seldom seen in cultivation. This is the more remarkable, because it is a plant that seeds so freely in the autumn. Its habit is good, forming a low, dense bush, well clothed with foliage, which is of a dark, dull green, from two to three inches long, and half-an-inch wide. The flowers are produced in bunches; and the ends of the shoots, each of which consists of a long tube, which, on an average, will be about four inches long, and very thin. This tube divides into four near the end, each division being an inch or an inch and a-half long; curves gracefully back till the ends or tips touch the tube, somewhat in the way that florists tell us the sepals of a perfect Fuchsia should be. When the flowers first open, they are white; they gradually turn to pink, and on to rose colour; the tint becomes deeper and deeper, until it becomes quite crimson; after which it quickly fades, and loses its beauty. But they are by no means short-lived; for they last as long as almost any flower. Each individual bloom will last a month; and as these are produced in great profusion, and in long succession, and are continually changing from light to a darker shade, they become very striking and novel in their appearance.

The best way to get young plants is to sow seed, which is produced in great abundance every autumn, if the plant be allowed to ripen it. This, however, should not be permitted, as it has a weakening effect upon the plant. A single pod will furnish some scores of seeds—which, in appearance, is very similar to Stock seed. This should be sown early in spring, and placed in strong heat, and kept moist until it come up above the surface. It should then be kept near the glass, and have air sufficient to prevent it from drawing. As soon as they can be handled, prick them out in a pan, two inches apart every way. This is better than putting them in small pots at this early stage of their existence. When they have made nice little plants, which they very soon will do, with proper treatment, they must be put singly into pots four inches in diameter; and encourage them to grow, by giving them a moist atmosphere, strong heat, and the syringe freely used in the afternoon. The object is to have the plants nicely established, and the pots well filled with roots, before winter sets in. A temperature from 50° to 55° , with an increase of 5° upon the last quoted point in bright sunshine, will keep them well through the winter months. In the spring, place them again in growing quarters, which simply means additional heat and moisture. This can be effected either by applying these two elements to the structure in which they stand, or by removing them to where they already exist. Pinch the tops out of each shoot, to cause them to break below; and as soon as the buds are fairly moving, transfer them to pots seven inches in diameter. Be careful not to administer too much water until they have taken to the fresh soil, and their growth will be most rapid. They must be stopped at every third pair of leaves, or they will form flower buds, and thus stop their growth. The shoots should be kept tied down to the edges of the pot, so as to form a bush somewhat in the shape of a bee-hive. This is best done by tying a piece of mat round the pot, under the rim, to which the young shoots can be fastened according to the taste of the cultivator. They delight in plenty of pot-room—in fact, will not thrive if this is denied them. A pot ten or twelve inches may be given about June, and the same course pursued as to stopping, tying, syringing, &c., until the end of the summer. The soil in which I have found it to flourish, is two parts fibry loam, two parts peat, one part leaf-mould, a little dung when the loam is not rich, with sand sufficient to keep the whole quite open and porous. Winter as before recommended, and all will go on well. The time when the plant is wanted in flower must guide in the operations of the spring. If wanted early, merely stand the plant in heat, and it will flower in May and June; but if it be desirable to have it in flower at the latter end of the summer or in autumn, then cut back all the young shoots, leaving two or three pair of leaves. The plant will break all over, and it must be encouraged, as in the former season, to make rapid growth, but not stopped, as in the previous season. If the pot in which it is growing

is considered sufficiently large, manure water should be given frequently, but not too strong. With this treatment it will flower beautifully at the end of the summer, and will repay for all the labour that has been bestowed upon it.

T. J., Manchester.

THE ASH-LEAVED KIDNEY POTATO.

BY MR A. PETTIGREW.

VERY few people of thought can sanction or give currency to the idea and statement of a great English writer and statesman that the Potato is an infamous vegetable. Why? Because almost everybody likes good Potatoes; and if he were put to choose a vegetable for his own dinner table throughout the year, would probably prefer Potatoes. Hence his hesitation "to amen" the proposal to abandon this favourite vegetable. Bread, meat, and Potatoes are the perfection of human food; we therefore hope that by the adoption generally of an improved system of farm management, and the reclamation of waste land, an abundance of these will be obtainable at reasonable prices by all classes of the community.

The scourging disease which almost invariably attacks our Potato fields every autumn, and sometimes earlier, renders the growing of late kinds of Potatoes very hazardous, to say the least. Hence the wisdom and necessity of paying more attention to the early sorts.

The value of the Ash-leaf Kidney, and the best mode of growing it, are not very generally known. Many gardeners look upon it as they do on some of our early Peas, which afford only a few pickings before the better sorts come in. Though not quite equal to some of the round kinds in flavour and mealiness, the Ash-leaf Potato is very good, and quite indispensable in a garden from which vegetables as early as possible are expected. How often do we see in good gardens a miserable crop of this noble and valuable Potato? Indeed such failure is so frequent and general, that the Squire has ceased to ask the gardener why there are so many blanks and vacancies of his Early Kidneys; and were the gardener asked, he could only say that they were carefully planted, but have not come up so well as the round sorts. Now the cause of this failure is not to be found in the process of planting, or after management, but in the winter treatment of the seed—very likely in the nurseryman's shop. When once the eyes bud or sprout, and get rubbed off, the Potatoes are comparatively worthless. I would not give a shilling a bushel for them, for they seldom do any good, but rot in the ground. After this month (October) they should be handled like eggs, and *never* put into sacks. Very well, let us now see how they are to be managed.

After *greening* the seed in July or August, spread them thinly on a cool floor or loft till Christmas, when they will be found slightly soft to the touch, with eyes or buds (one on each Potato) about the size of a bean; and on the buds roots are seen *ready* to start on their mission of activity and usefulness. Now, spread them singly on the floor, and cover all up with a light soil—rotten leaves are as good as anything for this purpose. If wanted for early work give them a watering; but where late spring frosts prevail, care must be taken to retard their growth. Don't cover with soil so soon—for as soon as they are covered, the roots very slowly run into this soil, and by the middle or end of March are able to carry food with them into the garden. The seed is now ready for the ground, and can without injury remain for a favourable time to plant them. In most gardens the manure is dug in the ground in the autumn or winter; and this is what farmers call *manuring* the ground instead of the crop; and the question is, which is the better way? Manure the crop say we with emphasis. To manure the ground is *good*—the crop, *better*—and both, *best*—especially for Turnips, Mangold, and Potatoes. Indeed, it is hardly possible to give too much dung for root crops. Another question is, when the crop is to be manured, whether it is better to put the manure under or above the seed or sets. We ourselves like to put some below, and a great deal above them, for the roots of the Potato come from the up-growing stems, and like to burrow and feed near the surface. Soil from under the potting bench, rotten leaves, ashes, and plenty of animal dung well mixed, make an eligible and excellent manure for Potatoes. Let the trench be filled with this or something like it, and we shall hear no more talk about the Ash-leaf Kidney being a *sluggish* bearer, and when dug up, every forkful will be like a litter of young pigs. Properly managed, this Potato will disappoint no one—it would become a universal favourite. It should be planted not less than 2 feet from row to row, and 1 foot between plant and plant.

In taking up the crop put aside for seed next year, a sufficient quantity, all about the size of hen eggs, and treat them as described above. There are other early kinds of Potatoes, the best of which is one grown extensively about Belfast called “the Cruille.” The American early, known in Scotland is a desirable sort. The early Shaw grown so much about London is as coarse as a Turnip, and not worth cooking. The Prolific, Moss, Cambridge, and Lapstone Kidneys are later sorts, and not so good as the Ash-leaf. I would never grow them. On the farm as well as in the garden, early Potatoes only should be grown, for they may be dug up before the disease makes its appearance. We get a crop of Coleworts, Savoys or Curly Greens, from this highly manured Potato ground, and the farmer may get a crop of Orange Jelly or other Turnip after his crop of early Potatoes, but this crop prevents Wheat being sown in autumn. Wheat sown in spring or other cereal may follow the Turnips.

HOT WATER CIRCULATION.

BY MR J. ANDERSON, GARDENER, MEADOWBANK, UDDINGSTONE.

I HAVE yet to offer a few remarks on the above interesting subject before leaving it, as far as I am concerned, to the criticism of the readers of the *Scottish Gardener*.

It will probably be remembered that I took an opportunity, towards the close of an article in your June issue, under the heading of "Heating of Horticultural Buildings," to discuss the best adapted boiler for Horticultural purposes; and after offering a few observations as to surface most exposed to radiant heat, I made a cursory remark on the appropriateness of boilers being formed so as to hold but a limited quantity of water; giving, as it appeared, my reasons for so observing—"and as we have little or no circulation in the pipes before the water boils in the boiler." This certainly was a very serious blunder, which I took the first opportunity afforded me of publicly correcting, just in time, too, to qualify "an Old Stoker's" very conclusive remarks on this point. But your readers are already aware that we differed very materially on the following passage, which he very modestly attaches to the end of his critical observations—"that it had formerly been a matter settled with him, that if boiler and pipes were properly balanced, there was no such thing as boiling in the boiler at all, and that such was not at all necessary to a most rapid circulation." This formed the basis of my article in August to which "Old Stoker," replies in September, somewhat sarcastically, taunting me as "an instructor in hot-water affairs." Now, sir, the whole style of his July remarks—minus his introductory details—are purely interrogatory, and were replied to, not in the marked sense of an instructor, but simply what I felt to be my duty, to submit from practical observation. Nor do I see anything so glaringly indiscriminate between my articles in July and August as to invite my anonymous friend's spectral allusions. It would be but trifling with your valuable pages, to reiterate arguments that have been handled on previous occasions, and which must have already formed impressions on your respective readers, not to be shaken by every wind that blows. But, as we have been favoured with the views of Mr Thomson of Dalkeith, to whom "Old Stoker" put a question or two, such views are entitled to a very serious consideration, from that gentleman's large experience in heating various structures, with boilers of his own invention, which boilers I am bound to confess are giving in the meantime very general satisfaction.

I have two or three questions to ask Mr T. on some of the opinions formed. I would first ask his method of testing—that which "Old Stoker" seems to have set down as a fact—that 500 gallons of water at a low temperature passes (*every drop*) through the

boiler in forty minutes after the fire was applied? and mark you, Mr T. gives it with an exactness which does him credit, and which completely puzzles all my powers of thinking. He goes on, after a few preliminary observations, to criticise that portion of my article which brought out "Old Stoker's" commentary in July; and I think, while tendering that portion of it for the benefit of your readers, he would have been doing me no more than justice to have quoted my subsequent explanation; and, after "snuffing" out the boiling properties of water, as applied to a proper constructed heating apparatus, he tries to frighten amateurs more thoroughly than ever, by doing me the honour to quote the passage, "boiling water in the boiler, expansion box high enough above the boiler, and air pipes communicating between the two, there is not the slightest danger." I have spoken on the first clause aforetime, and I now beg to allay the fears of the "uninitiated" with my expansion box. It is simply a supply cast-iron cistern, placed about 5 feet above the boiler, instead of supply tanks in the interior of the houses, an air pipe communicates from the top of the boiler into this cistern—a step so essential, even for the general circulation of the water, that I am surprised to hear Mr T. throw cold water on it. This is the much dreaded expansion box? serving also as a supply cistern, and standing in very little danger of "being blown to pieces," at least so long as there is water to circulate, and pipes laid to convey circulation; for we can have no steam, and therefore can have no blowing to pieces to startle even the most credulous, until the water is all at the temperature of 212° , in a word, until it has no power to circulate. We have a very striking example of this from "Old Stoker" in your September number. He says, "I remember once of being set a thinking, by a tremendous rush of steam from an air pipe not far from the boiler, the cause of which I soon found to be all the valves turned, and the water confined to a 5 feet saddle boiler, and a few yards of piping, with what a stoker would call a strong fire." How he must have chuckled within his own mind at having the water boiling "at the gallop" for once! and generating steam so copiously under his own cognisance. What would have been the case if he had not been provided with an air pipe between these valves and the boiler? I leave your readers to determine, showing how necessary, that we should be provided against all possible contingencies.

But Mr T. goes a step further than "Old Stoker," on the circulation of water. He says, I base my principle of proportionate heat to proportionate circulation on "false premises," for circulation does not at all depend on any given temperature of the water. I beg to ask Mr T. what then it depends upon? We get a very reasonable reply in the following sentence. "It depends solely on a disturbed equilibrium of the temperature of the water in the boiler and pipes." This, I opine, is the whole secret of circulation. But this does not necessarily imply that water at 100° , will act with as much power

as water at 150° ; neither does it imply that the water in the return pipe entering the boiler will only be 1° colder than that which is constantly sent into the flow pipe. We have instances of boilers that circulate water one, two, and even three thousand feet; but I cannot allow myself to think that water will travel all that distance—making due allowance for diverting it into several channels—and only be one degree colder when it returns to the boiler. Further, Mr T. must allow that the metal exposed to 30 minutes fire, will be less intense in heat than the metal exposed to 60 minutes fire, consequently, the water passing through the boiler must absorb more heat, become lighter, and by the longer application of fire, the water is always becoming lighter in boiler, in flow, and also in return pipes, and therefore must pass with greater rapidity, giving off caloric more freely, until the whole volume of water reaches the maximum of 212° . Finally, if circulation does not depend on any given temperature of the water, why all this hard firing in frosty weather? why do we have no mercy on the coals? If I understand Mr Thomson aright, and I should be sorry to misinterpret his meaning, that the water circulates as fast after the fire has been applied, as it does an hour afterwards—wherein THEN lies the secret of the rapid transmission of heat, when such is in request?

ON THE SPIRÆA CALLOSA.

BY HUGH FRASER, STANWELL NURSERIES, EDINBURGH.

It was stated in the *Gardeners' Chronicle* a few months ago that *Spiræa callosa* was the "handsomest flowering hardy shrub of July, after the Rose." Its decorative properties were shown forth in glowing language. The flowers of a vivid crimson colour, produced at the end of every shoot in trusses arranged like those of a *Laurus-tinus*, but more loosely, the trusses two inches across, and each branchlet bearing three such trusses, and "though each of their tiny flowers does not occupy the fifth part of an inch, yet their number amply compensates for their smallness." They expand gradually into bloom, so that a month's supply of flowers of all ages is provided at the time when the bush first breaks into blossom, while the quiet green of its leaves presents a beautiful contrast to the bright colour of the flowers. Add to all this the possession of a graceful bushy habit, and we have, "on paper," a gem of the first water; and when we consider the fact that it is no novelty but has been for years in the trade, without attracting special attention, we are apt to wonder that such a gem has been so long doomed to blush comparatively unseen.

It has hitherto however exhibited no appearance in this neighbourhood to justify the high praise bestowed upon it by your contemporary, not indeed that I would deny its merits. I am very

willing to admit that it is in its own way a very pretty thing, but I cannot see any quality it possesses to entitle it to a higher rank than many of the other species—on the contrary, there are others equal, if not superior for decorative purposes, and flowering at the same season, lacking nothing of graceful habit and striking colour, presented to us in callosa, all equally deserving a place in even small shrubberies, and will more than repay the little attention necessary to their proper cultivation. They thrive best in a dry light soil, moderately rich; as they are apt in too rich soils to grow too much to wood, by which they are prevented from flowering freely. The strong rank shoots should be shortened in the beginning of winter. Most of the species have a tendency to throw out suckers, which, if not checked, would soon give the bushes an untidy appearance. These should be cut clean off in the course of the ordinary digging among the shrubs, and the bush kept in a compact shape.

The following sorts along with callosa embrace the most attractive of the species :—

Arisæfolia.
Bella.
Douglasii.
Foxii.

Lindleyana.
Prunifolia flore plena.
Reevesiana.
Salicifolia.

SEEDLING DAHLIAS.

The following Seedling Dahlias have been forwarded to Edinburgh by Mr Turner, Royal Nursery, Slough, from time to time during the flowering season, a report of which may not prove uninteresting to those readers of the *Scottish Gardener* who take an interest in florist flowers.

Commander.—A very fine dark maroon, flower of great depth and close petal, finely built, and high centre; will be an acquisition in any stand—two blooms sent.

Lady Mildmay.—A very fine flower in the way of Annie, outline good, petal and centre fine, seems to stand better than Annie—the three flowers sent had not lost a petal.

Duke of Marlborough.—Dull red, outline good, fine petal, but flower rather young, and not in a condition to give a fair opinion.

Goldfinder.—Rich yellow, fine centre and good outline, of average size—two blooms sent.

Lord Fielding.—Large, shaded dark, high built, with fine centre and good outline, an extra show flower—three blooms sent.

General Havelock.—Fine clean orange scarlet, very fine outline, flower rather old, and a little gone in the centre, will prove very attractive.

Mrs Church.—Yellow, with bronzy tip, large, and very fine flower, young, with plenty of stuff in the centre.

Sir J. Watts.—Very fine bright scarlet, centre compact and well up, resembling Royal Scarlet very much, seems constant—three blooms sent.

Beauty of High Cross.—Dark ground, striped fancy, of medium size, and very promising.

Canary.—Bright canary yellow, medium size, and prominent centre.

Miss Watts.—Very fine white—three blooms sent.

Marion.—Still maintains its good character of last year.

Village Gem.—White, tipped with rosy purple—a very pretty flower.

JOHN LAMONT.

JOHN DOWNIE.

EXTRACTS FROM THE PROCEEDINGS OF THE NATIONAL FLORICULTURAL SOCIETY.

At a general meeting held on Thursday, September 17th, 1857, Mr John Downie in the Chair, the Censors, Messrs Sainsbury, Downie, Pope, Dean, Moore, and Edwards, furnished a report of the following awards to Seedlings:—

First Class Certificate to *Hydrangea variegata aurea superba*—Plant of vigorous habit, foliage large, with bold variegation of pale yellow, a novel and useful addition to the class of ornamental variegated foliaged plants; from Mr J. Salter, Hammersmith.

Certificates of Merit to the following:—*Dahlia*, Lillie Lund—Form good, size medium, substance stout, outline good, centre compact, colour primrose; from Mr Burgess, Chelsea. *Dahlia*, Standard Bearer—Form fine, size medium, substance medium, centre compact, outline good, colour purplish crimson; from Mr Alexander Leyton. *Dahlia*, Major Fellowes—Form medium, size large, substance stout, a massive deep flower, colour light rosy purple, in the way of "Mr Seldon" and "Touchstone;" from Mr C. Turner, Slough. *Dahlia*, Miss Watts—outline rather defective, centre good, colour white; from Mr C. Turner, Slough. *Dahlia*, Miss Pressly—Form medium, size average, substance good, centre compact and firm, somewhat low, colour light ground, with bold, distinct, and regular tips of purple; from Mr C. Turner, Slough. *Fancy Dahlia*, Jupiter—Form middling, size average, substance stout, colour maroon, with regular and bold tips, florets scarcely obtuse enough, in the way of "Claudia;" from Mr Rawlings, Bethnal Green. *Dahlia*, Mr Critchett—Form fine, substance medium, size average, colour light orange, not much dissimilar from Cherub; from Mr Rawlings, Bethnal Green. *Achimenes*, *Azurea oculata*—Habit that of *Longiflora*, colour lavender, spotted on the centre like *Ambrose Verschaffelt*; from Mr G. Wheeler, Warminster.

Label of Commendation to *Dahlia*, Princess Royal—Colour light ground, shaded rosy lilac; from Mr Salter, Hammersmith.

Memorandum—*Dahlia Imperial*—firm centre, and good arrangement of florets on the face of the flower.

Additional Memoranda.

DAHLIAS.

The following were exhibited by Mr Rawlings, of Bethnal Green:—*Mrs Boshell*—Rather flat in general outline, but full in the centre; the florets rather uneven in arrangement; blush white, striped with maroon and lilac. *King*—Buff, tinted with rosy-purple; rather small, but nicely cupped. *Cynthia*—Creamy ground colour, slightly margined with yellow; florets nicely cupped; flower deep, but rather sunk at the eye.

Mr Green, of Ware, exhibited:—*Village Gem*—A pretty flower, remarkable for its pure ground colour and regular marking, otherwise of average quality; white, tipped with rosy-purple; admirably suited for garden decoration, as are the two following. *Village Bride*—A light ground striped fancy;

yellow, with bright distinct stripes of crimson; rather flat, with open florets, but full. *Beauty of High Cross*—A dark ground striped fancy; red, striped with yellow; brighter than when previously shown; of average form, but small.

Mr Turner, of Slough, also exhibited:—*Marion* (FELLOWES)—White, tipped with pale purple; of tolerable form. *Mrs Church* (CHURCH)—One flower shown in similar condition to those noticed at the last meeting. *Sir James Watts*—Scarlet, with an orange tint at the back of petals; average size; compact, but confused centre. *Canary* (FELLOWES)—Bright canary yellow; medium size; good outline; the centre compact; florets nicely cupped, but not first-rate. *Goldfinder*—Yellow; large flat flower, closely cupped, but not filled in centre. *Lord Fielding* (GRANT)—Dark shaded maroon; a flower of high build and good general outline, but deficient in number of florets, thus having a broken surface; otherwise good. *Commander* (FELLOWES)—Crimson maroon; large, with cupped florets; the surface rather uneven. *Lady Mildmay*—Pale rosy lilac; outline tolerably good, but the arrangement of the florets rather confused. *General Havelock*—One flower; orange scarlet, nicely cupped, even in outline; scarcely of medium size.

Mr J. Salter of Hammersmith, also exhibited:—*Cedo Nulli*—A very pretty flower, but too shallow, though of tolerably good outline; white ground, nearly pure, streaked and splashed with slight markings of crimson and pale purple. *Madame de St Laurent*—Crimson, heavily tipped with white; the florets ridgy.

Mr Bragg, of Slough, exhibited:—*Mr Fulcher*—Rosy-purple, of full size, with irregular disposition of florets. *Pilot*—Dull deep red; tolerable outline, but confused arrangement.

Mr Pontey, of Plymouth, exhibited:—*Queen of the West*—Rosy-purple; full and compact; quilled florets.

Mr Dodds, of Salisbury, exhibited:—*Imperial*—Light rosy-purple, deepening to a light or crimson maroon towards the base of the florets; even outline; florets nicely cupped and symmetrically arranged in concentric lines in the upper two-thirds of the flower; the rest deficient. *Sir Colin Campbell*—A full-centred compact deep flower with cupped but ridgy florets, having a good general outline; dark lilac. *Miss Buckley*—Pale rosy lilac; rather coarse and irregular as shown. *Gladstone*—Yellow, with tip of dull red passing down the open cupped floret; size and outline average.

Mr Alexander, of Leyton, also exhibited:—*Loveliness*—Of good outline and deep, but rather flat-faced, and too small; white, heavily and prettily, because evenly tipped with purplish-crimson.

PELARGONIUM (PINK).

Mr Bragg, of Slough, exhibited:—*Empress*—A gay bright pink variety, blooming in large trusses on long footstalks; petals too narrow.

At the exhibition held on the 1st October, the following prizes to collections of Dahlias were distributed:—

Best 12 flowers—Lord Palmerston, Duchess of Kent, Lady Folkstone, Doctor Gully, Colonel Wyndham, Cherub, Sir J. Paxton, Princess, John Keynes, Admiral Dundas, Pandora, and Amazon—Mr Dodds, Salisbury. 2d best—Pre-eminent, Miss Caroline, Cossack, Marion, Canary, Robert Bruce, Annie, Lollipop, Satirist, Commander, General Havelock, and Lilac King—the Rev. C. Fellowes, Norwich. 3d best—General Faucher, Amazon, Colonel Wyndham, Annie Salter, Perfection, Rachel Rawlings, Duke of Wellington, Duchess of Kent, Fearless, Pre-eminent, Cossack, and Beauty of Slough—Mr Pope, Pimlico. 4th best—Richard Whittington, Caroline, Pre-eminent, Annie, Duchess of Kent, Robert Bruce, Amazon, F. Bathurst, Seedling, Dundas, Miss Spears, and Lollipop—Mr Cook, Notting Hill. 5th best—Amazon, Omar Pacha, Rachel Rawlings, Lord Palmerston, Bessie, Mrs Wheeler, Beauty of Slough, Meteor, Cherub, Pre-eminent, Yellow Beauty, and Lollipop—Mr Humber, Southall. 6th best—Empress, Golden Tip Seedling, Rachel Rawlings, Lord Palmerston, Beauty of Grove, Mrs Edwards

Princess, Grand Sultan, Amazon, Constancy, Lady Folkstone, and Colonel Wyndham—Mr Hopkins, Brentford.

Best 6 fancy flowers—Triomphe de Rubeau, Oliver Twist, Duchess of Kent, Inimitable, Imperatrice Eugenie, and Carnation—The Rev. C. Fellowes. 2d best—Lady Paxton, Charles Perry, Duchess of Kent, Souter Johnny, Carnation, and Cleopatra—Mr Dodds. 3d best—Topsy, Butterfly, Miss Frampton, Inimitable, Eugenie, and Wonderful—Mr Humber.

Best specimen white—"Miss Watts"—Mr Turner.

 yellow—"Sir J. Paxton"—Mr Dodds.

Best tipped fancy—"Lady Paxton"—Mr Turner.

Best striped fancy—"Charles Perry"—Mr Dodds.

A large number of seedling Dahlias which had been previously exhibited were on this occasion reproduced, and for the most part sustained the awards granted to, and the general descriptions given of them, some eminently so, viz., Marion, Mrs Church, Commander, Miss Watts, Miss Pressly, Standard Bearer, Beauty of High Cross, Village Bride, Oliver Twist, and Lillie Lund.

Mr Turner staged 96 flowers of all the newest and best kinds—a valuable contribution; also a stand of 12 blooms, sorts let out by himself, each bloom being an admirable specimen:—Midnight, Touchstone, Cherub, Lady Popham, Satirist, Lord Palmerston, Lollipop, Colonel Windham, Miss Burdett Coutts, Pre-eminent, Lord Bath, Sir J. Franklin. 36 blooms, grown in the gardens of Buckingham Palace were also exhibited by Mr Wyness, gardener to Her Majesty.

The Censors, Messrs Keynes, Turner, W. Holmes, Robinson, Lidgard, and Moore, furnished a report of the following awards to seedlings:—

Certificates of Merit to the following: Dahlia, Village Gem—Form average, size medium, substance stout, colour white with rosy-purple tip; from Mr Turner, Slough. Dahlia, Loveliness—Form good, size below average, substance very good, colour creamy-white, tipped purplish-crimson; from Mr Turner, Slough. Dahlia, Rosebud—Form bold, size full, substance fair, colour bright lively deep rose; from Mr Alexander, Leyton. Fancy Dahlia, Princess Leonora—Form and size medium, substance good, colour light rosy-purple with white tips; from Mr Slipper, Camden Town.

VINE GROWING AT TRENTHAM.

A house of Vines, 60 feet long, which were taken up and replanted in Sept., 1856, have borne so well this year that numerous inquiries have been made as to the mode of treatment adopted; and as writing letters, necessarily of some length, is a serious tax on a gardener's time, I shall be glad to reply, through the medium of the *Chronicle*, if the matter be considered worthy of insertion.

Most of the Vines having been planted 16 years, and the soil having become close and much exhausted, the Grapes were no longer so good as formerly. To remedy this we took up all the roots in the latter part of September, the leaves being still on the Vines, but the wood ripe and hard. The work of removing the soil lasted several days, as it would not have been by any means economical to have hurried an operation of so much importance. While the work was going on every root and fibre that could be saved was kept as much as possible from exposure to the air by means of mats which were damped when necessary; and when all the soil was removed the roots were tied carefully up in as small a compass as possible without over-bending the stronger ones. Damp Moss was then laid round them, and the whole enclosed in mats and tied up against the front of the house. That part of the floor of the border which was concreted was well swept, and the front part consisting of open drainage of broken bricks was loosened up to make all perfect. Upon this was laid to the depth of a foot a mixture of rough material, such as broken bricks, charcoal, bones, and lumps of fibry turf; and

upon this again another foot of turfy loam, with charcoal, rough lime rubbish from an old building, and some charred turf with the ashes of the wood used in the charring, all mixed well together. The roots were then laid nicely on the surface, and the longer ones shortened in so as only to cover about two thirds of the space which they formerly occupied, that being the extent of the new border, which was not then made up to its full width. Some of the same mixture as the last was then laid over the roots to the depth of 6 inches, and the border was finished.

The weather being warm, and the soil in the most favourable state for the roots to work in it, I felt sure that they would begin to establish themselves immediately, and that by covering the border a foot thick with dry Fern, and putting wooden shutters over the whole, we should not only secure them against rain, but keep the soil warm through the winter. In a week or ten days the temperature had risen by a slight fermentation in the new soil, and I was quite satisfied about the success of the Vines as to leaving a slight crop this year. The leaves of course drooped for a time, and some of the bottom or oldest ones never revived, but those near the tops of the spurs and the laterals recovered, and a slight growth took place in some of the young laterals which was quite satisfactory. The Vines were closely pruned in December, but not shortened in the main rods or stems. The house was kept cool till the buds began to move, in March, by the natural warmth of the season, when some fermenting material was laid all over the border and in front of it so as to raise the temperature to 70°, which heat was maintained throughout the months of April and May, after which nothing more was done to them for a month. In July the greater part of the litter was removed, and the border watered; and by placing the shutters close on the surface of the border, the heat was prevented from escaping. The Vines, of course, broke weakly, but gradually gained strength, and by keeping a moist atmosphere constantly, the young shoots and shows, of which there were abundance, were well supported during sunny days. No shading was used, lest it should have a tendency to make the leaves less able to endure the heat of July and August, which is so trying to all Vines, especially in houses not ventilated on a natural and efficient plan, which but few are. From 8 to 12 bunches were left on the longest Vines, and the fruit was well ripened, and of a fine amber colour. They have made fine spurs, which are hard as Oak, and promise well for another year; and the border which has been this day uncovered is teeming with young healthy roots. We are now adding two feet more to the front of the border, topdressing with turfy loam, small bones, and broken sandstone. The covering will be put on again for the winter as last year, but no warm litter will be required in the spring, the house being intended for a late crop. Some of the bunches on the Muscat Vines in this house were over 3 lbs. weight, and we obtained first prize for three sorts of Grapes at the Crystal Palace, two of which, viz., Cannon Hall and Muscat of Alexandria, were selected from among them. We also exhibited a dish of Muscats from the same house at the Horticultural Meeting on Saturday last, but were beaten, as we all ought to be sometimes, as an additional inducement to try again. [Nevertheless the bunches shown were excellent.]

With regard to ventilation, I am of opinion that ridge and furrow roofs will speedily supersede the lean-to. The ridges should be 4 feet wide, with a Vine to each ridge. The ridge pieces should be double and 6 inches apart, with a cap to raise and fall the whole length of the ridge by a simple movement; thus giving air, or rather letting out the over-heated air, exactly at the most suitable place. In wide flat houses the air is stagnant in still hot weather, and the leaves scorch. There are more Vines and Grapes injured by this than any other cause. We are now having a house built on the plan just described, which we hope will prove an efficient one as regards ventilation. It will be 140 feet long and 20 feet wide, and is intended for a late vinery. There are three old flat lean-to houses in the situation where this new one is to be, the Vines in which have always been more or less scorched.

While on the subject of Vines, I may remark that the excellent paper of "M. J. B." has led me to examine our Vine and Peach borders, in search of the destructive fungus described at page 692. I am sorry to say that in some of the vineries, and also in the Peach houses, I have found masses of it, particularly under and near the arches of the front walls, where there is generally a vacancy caused by the sinking of the soil, and where it is kept rather dry by the arch. From this it would appear that the fungus spreads most in loose and moderately dry soil, and where it is not liable to get thoroughly wetted at any time. I believe that heavy watering or much rain will destroy it, and I also find that diluted gas water, or soot in water, kills it, but these remedies must be carefully applied. The presence of this pest may in general be detected by the growth of a small flat light coloured Mushroom, many of which have been noticed on the borders here.

I send you some of the fungus, and you will see that the Peach root to which the threads are attached is quite destroyed by it. The lump of loam, which is full of the spawn, was taken from the surface of a border which has been left dry nearly all the autumn on account of there being a crop of Grapes on the Vines which we wished to preserve to as late a period of the season as possible. We shall try the gas-water upon it again, and report the result in due time.—G. FLEMING, in *Gardener's Chronicle*.

WINTER PROTECTION.

Another week of mild weather has given an extension of time for winter preparation, and it will be the gardener's own fault if he has not everything this season in safe quarters before frost sets in. If our directions of last week have been attended to, the plants themselves will be ready for their different locations, whether in the greenhouse, the pit, the frame, or some other occasional habitation. With the means of artificial heating at hand, an experienced cultivator need have little anxiety. But few gardens are fully provided with such a luxury, and the question presses, What am I to do with the numerous things which cannot be brought within the range of fire heat.

As we stated before, Verbenas, Calceolarias, Cuphæas, Salvias, Fuchsias, and fifty other things, will endure very hard frosts, provided they are under cover, are kept dry, and allowed to thaw gradually when mild weather returns. Our plan with such plants is this:—We raise a frame on brick-rubbish, about six inches above the surrounding soil, in order to keep the bottom as dry as possible during the winter. We then stand the plants in pots on this pavement, and surround them with pretty dry garden mould, up to the rim of the pots. In doing this, the aim should be not to let the foliage of the plants be too much crowded together, an evil which may be avoided by placing small and large plants alternately. In this way we have disposed of a large number of pots, and we shall give all the air we can in fine weather, by removing the lights quite off. When a hard frost can be foreseen, as it easily may, the frame will be surrounded with leaves up to the glass, and mats thrown over at night. We have kept Pelargoniums in this way, during pretty hard frosts; but the risk run is very considerable, and much skilful watching is required.

In such a frame as this we have packed away some of our Brompton Stocks, taken up and potted; having failed in keeping any last winter in the open ground. Also Auriculas in pots, and other things which are more injured by wet than by frost. Tender Roses, taken up with balls, and planted in such a frame, will do very well; and, if pots are scarce, they may be dispensed with in the case of Fuchsias. We prefer keeping old Calceolarias, with full foliage, in the greenhouse; but the cold pit or frame does very well for the cuttings of the shrubby bedding kinds. These we have in pans and boxes, mostly rooted, and shall leave them as they are until the spring.

Supposing that there is no greenhouse, or that that structure is not large enough for all the tender stock, a good deal in the way of protection may be done in the dwelling house. We have put about a hundred and fifty nice

little plants of Variegated Geraniums in our windows, in different parts of the house. Some old-fashioned houses are furnished with window-ledges; but if that convenience is not at hand, tables, or shelves put up for the purpose, will do as well. A spare room will contain very many things, within the influence of the light from a small window; for no winter plants, if kept dry, will do without much of the sun's rays. A bedroom will be rendered more pleasant by a row or two of such wee things in the windows, and we need scarcely stop to refute the prejudice that a *little* foliage will do harm to the sleepers. All such domestic plants should be kept moderately moist if they can have sunlight, but less so if the aspect is northern. In hard frosts we shall remove the pots to the middle of the room, or to such part of it as will effectually preserve them from their ravages.

Fuchsias in pots; Scarlet Geraniums cut down; Dahlia roots, and lots of other hardy things which do not need foliage for their vitality, may be tucked away in cellars, lumber rooms, barns, or any other places, dry and above the freezing point. But through the winter all plants should be watched. There may be damp generating, which will require a shift or two; or rats and mice may get to the plants and eat them away; or frost may be stronger than was anticipated. In fact, there is no royal road to the preservation of a stock of flowers during an English winter. Such things, like children, need daily attention, and this will only be given when they are loved. The gardener who would not rise on a winter's night to protect a greenhouse if he found frost had unexpectedly set in, has not the enthusiasm necessary for the successful prosecution of his craft. Those whose maxim is, "I like flowers, but not the trouble of them," had better let their stock die at once, and apply to a nurseryman to renew it at planting time in the spring and summer.—*Field*, Nov. 21.

STOKE NEWINGTON CHRYSANTHEMUM EXHIBITION.

THE Eleventh Annual Show was held on the 17th and 18th ult., in the Manor Rooms as heretofore. The arrangement of the tables was a great improvement over that of former years, and reflects greatly to the credit of Mr Rhodes, one of the committee, by whom it was suggested and carried out, for without reducing the amount of table room, greater facilities were afforded for a continuous promenade, thus wholly avoiding much of that inconvenience and crowding, which the confined space of the room seemed to enforce. That Mr Rhodes was unceremoniously treated in return for his services, we shall not care to deny, nor do we wonder at his determination to withdraw from the Society. Let us, however, hope that he will reconsider his resolution, and that some explanation will enable him to do so.

With the memory of the past most vividly in our mind's eye, we cannot but set the general collections of blooms and plants as a little below the quality of former years, but in thus stating our opinion, it may be as well to justify ourselves by giving the whys and wherefores. In the first place, then, we wish it to be well understood that the particular exhibitors on this occasion kept up their respective and collective excellences, and with them there was no apparent falling off; but we seem to feel the loss of the Weatherill Pompones, and the Taylor and Sanderson collections of cut blooms, the which have for some seasons past played most conspicuous parts in the general exhibition, but which were not now forthcoming by reason of circumstances over which neither themselves nor the Society had any control.

The advent of a new plant exhibitor (Mr Holland of Hounslow), must be received as auguring well for the future, and his success—that of first prize, a noble silver cup—for six Pompones, must have been a cheering reward for the necessary toil in cultivating his specimens. We are sure that Mr H. will pardon us for stating that he can yet do better; certain it was that his plants of Bob and Brilliant were really fine—not so his Comte Achille Vigier, which, even at its best, is of a mixed and ill defined colour, unworthy the attention of a grower of taste.

That the show was well furnished may be gathered by the awards. These are given to two-thirds of the exhibitors in each class, and extended to 6 prizes for 24 blooms, 9 prizes for 12 blooms, 8 prizes for 6 blooms, 3 prizes for 6 Anemone blooms, 2 prizes for Anemone Pompones, 3 prizes for Maiden Growers 6 blooms, 4 prizes for 6 plants of Pompones, 2 prizes for 6 plants of the large flowering kinds, with prizes for specimen plants; a total of 40 prizes were thus adjudicated, whose value in the aggregate is something over £80—a very handsome sum when the nature of the show is taken into consideration, wholly that for Chrysanthemums,

for not a plant or flower of ought else was there in aid or in case of need. The four principal prizes were silver cups, costing £23.

Of visitors there were exceeding 1000, and as usual not a few from the most distant parts of the kingdom.

Mr A. Wortley, the indefatigable honorary secretary, not only conducted the duties of his office in the most workmanlike and decisive way, but fully maintained his well earned reputation as a first-rate grower, as the list of prizes will demonstrate.

The censors were for plants, Messrs Kendall, Boff, and W. Cutbush; for blooms, Messrs Croxford, Shields, and W. Monk.

Best 6 plants.—1, Mr Argent, with Albin, Defiance, Christine, General Havelock, Vesta, and Unknown; 2d, Mr James—Vesta, Albin, Christine, Mount Etina, Plutus, and Pilot. The collection shown by Mr Scruby was very meritorious.

Best single specimen.—1st, Mr James, with Annie Salter; 2d, Mr Argent, with Madame Camerson.

Best 6 Plants of Pompones.—1st, Mr Holland—Comte Achille Vigier, Pluie d'Or, Brilliant, Cedo Nulli, Bob, and Duruffet; 2d, Mr A. Wortley—St Thais, Cedo Nulli, Requiqui, Drin Drin, Brilliant, and Duruffet; 3d, Mr Scruby—Duruffet, Drin Drin, Trophe, Helena, Madame Rousellon, Bob, and Graziella; the other collections were for the most part formed of similar varieties to the foregoing.

Best 24 Blooms.—1st, Mr A. Wortley—Themis, Arigina, Beauty, Annie Salter, Lysias, Goliath, Nonpareil, Madame Mieliez, Pio Nono, Aristée, Dupont de l'Eure, Rosa Mystica, Hermione, Madame Audrey, Racine, Versailles Defiance, Elizabeth, Stellaris globosum, Miss Kate, Marquis de Melleville, Stafford, Yellow formosum, and L'Esmir; 2d, Mr Bird—Anaxo, Arigina, King, Themis, Trilby, Goliath, Queen of England, Nonpareil, Madame Lebois, Hermione, Madame Audrey, Voltaire, Arc en Ciel, Versailles Defiance, Plutus, Pio Nono, Yellow formosum, Stella globosum, Miss Kate, Stafford, Albin, Formosum, The Warden, and Dupont de l'Eure; 3d, Mr James—King, Queen of England, Themis, Goliath, Beauty, Anais, Nonpareil, Madame Audrey, Albin, Dupont de l'Eure, Formosum, Campestro-roni, Madame Lebois, Trilby, Christophe Colomb, Defiance, Madame Mieliez, Plutus, Arc en Ciel, Miss Kate, Gloire de Toulouse, Yellow formosum, Hermione, Stella globosum; 4th, Mr D. Monk; 5th, Mr Oubridge; 6th, Mr Elliott.

Best 12 Blooms.—1st, Mr D. Monk—Alfred Salter, Themis, Queen of England, King, Anaxo, Goliath, Nonpareil, Beauty, Plutus, Christophe Colomb, Trilby, Dupont de l'Eure; 2d, Mr Oubridge—Nonpareil, Arigina, Themis, Madame Audrey, Queen of England, Stafford, Plutus, King, Miss Kate, Dupont de l'Eure, Voltaire, Hermione; 3d, Mr James—King, Queen of England, Themis, Beauty, Goliath, Nonpareil, Dupont de l'Eure, Anaxo, Madame Miell z, Plutus, Madame Audrey, Formosum; 4th, Mr A. Wortley—Beauty, Arigina, Nonpareil, Themis, Madame Mieliez, Racine, Miss Kate, Hermione, Dupont de l'Eure, Madame Audrey, Aristée, Plutus.

Best 6 Blooms.—1st, Mr D. Monk—Queen of England, Themis, Beauty, Nonpareil, Dupont de l'Eure, Plutus; 2d, Mr James—King, Queen of England, Beauty, Plutus, Dupont de l'Eure, Nonpareil; 3d, Mr Oubridge—Queen of England, Themis, Nonpareil, Stafford, Plutus, and Dupont de l'Eure.

Maiden Growers.—1st, Mr Peasgood; 2d, Mr Worth; 3d, Mr Glover.

Best 6 Anemone Blooms.—1st, Mr A. Wortley—Madame Godereau, King of Anemones, Gluck, Marguerite d'Anjou, Fleur de Marie, Nancy de Sarmet; 2d, Mr Bird—Gluck, Marguerite d'Anjou, Marguerite d'York, Madame Godcreau, Elipse, Nancy de Sarmet.

Best 6 Anemone Pompones.—Mr A. Wortley—Rose Marguerite, Jeannie Hachette, Regulus, Autumnus, Tornado, Margueritedetto.

CULTURAL DIRECTIONS FOR THE ROSE, BY JOHN CRANSTON, Nurseries, King's Acre, near Hereford.—We have received this cheap little work, and commend it to our readers, and particularly to amateurs, as containing everything essential to be known in the culture of this beautiful flower. Besides general directions on choice of sorts, soils, planting, pruning, &c., judicious lists of Roses for particular purposes are given, and Calendar of Operations is appended. It contains exactly the kind of information wanted by beginners.

CALENDAR OF OPERATIONS FOR DECEMBER.

VEGETABLES.

Leave no opportunity of trenching every spare yard of ground in the kitchen garden. Place regular supplies of Seakale, Rhubarb, Asparagus, (and where required) Sorrel in heat. See that Lettuces and Cauliflower frames do not suffer

from the attacks of slugs. The best way to catch those gentry is to pay the frames a candle light visit when the night is mild; they may then be caught in the act. Prune Currant and Gooseberry trees, and prepare for planting additions to such, by trenching the soil at least 2 feet deep, adding a good coat of farm-yard manure when to be had; failing that, use decaying vegetable matter of any sort that may be at hand. Raise and prune the roots of Pear and Apple trees, where you have reason to believe they have gone into the subsoil; lay them carefully in a little fresh loam and near the surface; when weather is mild prune and nail wall trees; in fact, do all now that can be done as well as in spring, for that season will bring more than enough of work for all hands with it.

FORCING DEPARTMENT.

PINES.—This and next month are critical months for Pine growing; they should be carefully examined to see that while none—such as those nearest the pipes or flues—suffer for want of water; others do not suffer from too much of that element, especially where the lights are not water-tight. We have seen many a good Pine plant injured from this cause, throwing up a malformed fruit in the spring. Let the night temperature of plants in fruit be 60° , running up during the day with air on to 65° or 70° ; bottom heat from 70° to 75° . Those plants that are expected to start in January, or February may have a night temperature of 55° , and the suckers taken off during the autumn will do very well if 50° is maintained during the night.

VINES.—The early vinery, which may now be showing the bunches, will require great attention. As soon as the buds are burst, syringing ought to be discontinued, and the moisture of the atmosphere maintained by some such device as was figured in the March number of *Scottish Gardener*; turn some portion of the fermenting material in the house daily, by which means it will evolve some portion of its heat, carrying moisture with it, which is most beneficial for the Vines; besides which, it saves fuel. As soon as the bunches fairly declare themselves, pick all off except one to a shoot, and stop the shoot one joint above the bunch. Night temperature 60° , running up with sun heat, when to be had, to 70° . Vines in pots may have the same general treatment as recommended for the others, with the additional care they require in never being allowed to get dry at the root. When the foliage is fully developed, give a watering of water with 1 oz. guano to the gallon.

PEACH HOUSE.—Get the trees pruned and washed over with a mixture of soft soap, tobacco water, soot and clay, that are to be started in January—those started last month and this will require great care. Use as little fire-heat as possible; rather let the house drop to 35° in severe weather than fire hard.

STRAWBERRIES IN POTS.—Presuming that these were properly protected last month, prepare the first batch for being placed in heat about the middle of the month; begin them as gently as circumstances will admit of.

CUCUMBERS require great care this month; preserve a happy medium between moisture and dryness which cannot be described but in its effects. You will see in the one case the leaves drying up round the edges; in the other damping off. A prevailing error is to let them bear too many fruit at once.

THE ORCHARD HOUSE should rest during this month, and may to some extent be made the receptacle of Endive, Lettuce, Cauliflower, and Broccoli, to protect them from frost till required for use.

FLORISTS' FLOWERS.*

DAHLIAS.—Examine the roots occasionally; should any be getting damp and mouldy, or any appearance of decay in the tubers, cut away the affected parts at once, and expose the roots to the air for a day or two before returning them to their winter quarters.

CINERARIAS.—Continue last month's directions.

PANSIES IN BEDS in exposed situations will be greatly benefited by having a few Spruce branches or something similar placed round the sides of the bed

* By Mr J. Downie, of Downie & Laird.

to protect them from boisterous winds, frosts, &c. Make sure that the plants are all well secured to small stakes, or pegged down, as many are apt to lose the tops, especially in frosty weather, if this precaution be neglected.

PANSIES IN POTS.—Continue last month's directions.

CALCEOLARIAS.—Seedlings may still be potted off singly into small pots; use light soil, adding a portion of well rotted cow dung, and a little leaf-mould. Cuttings may also be potted now if well rooted; use soil similar to that directed for the seedlings; remove all decayed foliage from the old plants; air freely on all occasions when the weather is favourable; if it can be avoided, use no more fire heat than just sufficient to keep out frost. Fumigate if there is the least appearance of greenfly.

HOLLYHOCKS.—Give air constantly day and night in fine weather; remove all decayed foliage, and be careful not to overwater, especially those wintered in cold pits or frames; cover up well during severe frosts; otherwise, very little attention will be required during this month.

PELARGONIUMS.—Carry out instructions given in last month's Calendar; only be careful not to overwater at this season; remove all decayed foliage, and attend to cleanliness in every department.

AURICULAS.*—These plants will now be dormant. All the attention they require is to keep them free from decaying leaves, and from drip. Give all the air possible during all mild weather. Owing to an error in last month's Calendar, the directions are not intelligible. What was meant was, whenever a plant shows the foliage in a flaccid or shrivelled state, give a little water to plump or swell the leaves again.

POLYANTHUS.—The directions given last month are applicable to this.

PINKS.—All that is necessary to observe with respect to these plants from this time till March, is to protect them from being broken over by heavy winds. This is absolutely necessary, the plants being extra strong this season. Keep the beds free from weeds, and after severe frosts go over the beds, and replace all plants in the soil that have been thrown out by the frost.

TULIPS will now all be in the ground. All the attention they require is to keep heavy rains from the show beds.

CARNATIONS AND PICOTEES.—Continue to keep the plants free from decaying leaves; just give as much water as will keep the plants from flagging. Give all the air possible during all mild weather. Guard against spot by keeping the foliage dry. During severe frosts shut up close. A mat over the glass will insure against loss of plants.

CHRYSANTHEMUMS.†—These will now be in great beauty, and will amply repay all the labour bestowed upon them. The greenhouse or conservatory would indeed be gloomy without them at this dull season of the year. They have one great advantage over many flowers, that they can be grown to any size or form to suit the various necessities of the cultivator; the tall-stemmed with single blooms or clusters for mixing with large plants in conservatories; specimens for large stages, and sides of pathways; Pompones for tables and small stages, &c.; they can indeed be grown from 8 or 10 inches to as many feet. They have bloomed much earlier than usual this season, and the flowers are much darker, for which we are indebted to our fine summer. This is the best time to commence propagating for large cut blooms. I prefer strong suckers with as much root attached as possible. Pot in $3\frac{1}{2}$ or 4 inch pots, in equal parts of loam, leaf-mould, cow-dung, and silver sand. Plunge in a hand-light at the bottom of a wall or spent hotbed. Water and keep close for a few days, but don't allow damp to destroy the leaves. After they are sufficiently established give as much air as possible, and in fine weather take off the glass altogether. The great object to be obtained at this period of their existence is to get them thoroughly rooted without elongating the top. The growth made in winter is invariably weak and spindly, consequently is to be carefully avoided.

* By Mr G. Lightbody, Falkirk.

† By Mr Laing, Dysart Gardens.

AZALEAS.—A few of the earliest set plants may be introduced into a gentle heat; syringes overhead occasionally; they are easily forced when the buds have been early, and thoroughly matured, and few plants are more beautiful than a well-bloomed Azalea, but they are specially so when winter reigns supreme. Plants intended to flower late should have plenty of air, kept free from dead leaves, watered carefully, and sufficient fire to keep out damp and frost.

EPACRIS.—The early sorts will now be very gay. Remove to the conservatory as they come into bloom. Water carefully.

NOTICES TO CORRESPONDENTS.

W. M. W.—The following 48 Pansies are all proven varieties, and will answer your purpose well. Those marked thus * may be considered the finest :—

SELS.

- | | |
|--------------------|--------------------|
| * Ariadne. | * Indian Chief. |
| * Bessy. | * Jeannie. |
| Dred. | Mary Taylor. |
| Flower of the Day. | Royal White. |
| * Georgey. | * Royal Albert. |
| * Gem. | Uncle Tom's Cabin. |

YELLOW GROUNDS.

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|--------------------------|----------------------|
| * Alice. | Monarch. |
| * Admiral Dundas. | * Napoleon (Hooper). |
| * Cyrus. | * Prince Albert. |
| * Duchess of Wellington. | Rev. H. Gosset. |
| Father Gavazzi. | * Sir J. Cathcart. |
| Jubilee. | Sir C. Napier. |
| Lady Emily. | Red Rover. |
| * Lord Cardigan (Hall). | * Willi m. |

WHITE GROUNDS.

- | | |
|----------------------------|--------------------|
| Argo. | Miriam. |
| * Beauty. | Nonpareil. |
| * Countess of Roslin. | Nina. |
| * Colonel Wyndham (Laing). | * Royal Standard. |
| * Delight. | Rebecca. |
| Eve Lightbody. | Rifleman. |
| * Louisa. | * Sir E. Lyons. |
| * Mrs B. Stow. | * Sir C. Campbell. |
| Miss Walker. | * Una. |
| * Miss Talbot. | |

A SUBSCRIBER will find the following hardy perennial herbaceous plants very suitable for a moderate sized garden—

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|------------------------|-------------------------|
| Alyssum saxatile. | Delphinium hybridum. |
| ————— variegata. | ————— Hendersonii. |
| Anthericum liliastrum. | ————— magnificum. |
| Anemone patens. | Dodecatheon elegans. |
| Arabis incana. | Gentiana verna. |
| Campanula coronata. | ————— saponaria. |
| ————— carpatica. | Lychnis double scarlet. |
| Delphinium formosum. | |

Six early flowering *Phloxes*.

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|----------------------|-------------------|
| Abdul Medschid Khan. | Countess of Home. |
| Addisonii. | Colonel Dundas. |
| Countess of Morton. | Masterpiece. |

Six late flowering *Phloxes*.

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|-----------------|---------------------------|
| Admiral Lincol. | Madame Randalter. |
| General Brea. | Mademoiselle C. Fontaine. |
| Lychniflora. | Rubra. |

- Ranunculus amplexicaulis.
 Spirea vanusta.
 Teucrium dentatum.
 Thermopsis fabacea.
 Saxifraga pyramidalis.

- Saxifraga incrustata.
 ——— muscoides.
 Sisyrinchium grandiflorum.
 Scilla Siberica.
 ——— præcox.

